CITY OF HESPERIA

CLIMATE ACTION PLAN

July 20, 2010

Hesperia Climate Action Plan
City of Hesperia, California

Prepared for:

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TABLE OF CONTENTS

Section 1: Executive Summary 1
1.1 - Climate Action Plan Purpose 1
1.2 - Climate Change 1
1.3 - Emissions Inventory 1
1.4 - Climate Action Plan Strategy 2

Section 2: Introduction 3
2.1 - City of Hesperia 3
Residential Development 4
Specific Plans 7
The City's Role in Reducing Emissions 9
2.2 - Mojave Desert Air Quality Management District 9
2.3 - Purpose 9
2.4 - Climate Change Science 12
2.5 - California Regulatory Context 14

Section 3: Emission Inventory 17
3.1 - Emission Inventory Overview 17
3.2 - Hesperia Inventory 17
Community Emissions 17
Hesperia City Government Electricity Emissions 21
3.3 - Reduction Target 21
3.4 - Strategy Reduction Summary 23
3.5 - Reductions from State Scoping Plan Measures 24

Section 4: Climate Action Strategies 31
4.1 - Climate Action Strategies 31
CEQA Compliance 32
Mixed Use Development 32
Transit-Oriented Development 35
Compact Development 37
Pedestrian Connections 39
Bicycle Infrastructure 42
Traffic Calming 44
Parking Measures 45
Energy Efficiency 46
Water Conservation and Reuse 48
Waste Reduction and Recycling 51
Regional Cooperation 53
Government Operations 53
Climate Change Adaptation 54
4.2 - Implementation and Monitoring 54

Section 5: Climate Change Adaptation 67
5.1 - Wildfires 67
5.2 - Water 71
Water Supply 71
Flooding 73

Section 6: Glossary of Terms and Acronyms 77

Section 7: References 79

Appendix A: Detailed Emission Inventory

Appendix B: Southern California Edison Reports

LIST OF TABLES

Table 1: City of Hesperia Greenhouse Gas Emissions Summary 2

Table 2: City of Hesperia Community Business as Usual Emissions 18

Table 3: City of Hesperia 2020 Reduction Summary 20

Table 4: City of Hesperia Electricity Emissions 21

Table 5: Community Emission Reductions from CAP Strategies 24

Table 6: 2020 Community Greenhouse Gas Emission Reductions from State Regulations and AB 32 Measures 29

LIST OF FIGURES

Figure 1: Regional Location Map 5

Figure 2: The Greenhouse Effect 12

Figure 3: Global Atmospheric Concentration of CO_2 13

Figure 4: California Greenhouse Gas Emissions in 2006 (Gross Emissions=483.9 $MMTCO_2e$) 14

Figure 5: Hesperia Community Greenhouse Gas Business as Usual Emissions 19

Figure 6: Hesperia Community 2020 Emissions 19

Figure 7: Hesperia Business as Usual Per Capita Emissions 20

Figure 8: Acreage in Hesperia 33

Figure 9: Residential Acreage Comparison in Hesperia 38

Figure 10: How Climate Change Impacts a Watershed 72

SECTION 1: EXECUTIVE SUMMARY

The City of Hesperia (City) has prepared a Climate Action Plan (CAP) as its primary strategy for ensuring that the buildout of the General Plan Update will not conflict with the implementation of Assembly Bill 32 – the Global Warming Solutions Act of 2006. Assembly Bill 32 (AB 32) requires California to reduce statewide greenhouse gas emissions to 1990 levels by the year 2020, which is about a 29 percent reduction from 2020 business as usual. This CAP is designed to reduce community-related and City operations-related greenhouse gas emissions to a degree that would not hinder or delay implementation of AB 32.

1.1 - Climate Action Plan Purpose

The purposes of this CAP are as follows:

- Outline a course of action for the City government and the community of Hesperia to reduce per capita greenhouse gas emissions 29 percent below business as usual by 2020 and adapt to effects of climate change.
- Provide clear guidance to City staff regarding when and how to implement key provisions of the CAP. This CAP sets out an implementation and monitoring framework for monitoring its strategies.

1.2 - Climate Change

The earth's natural warming process is known as the "greenhouse effect." Human-related sources of greenhouse gases have been growing to unprecedented levels since the Industrial Revolution. Increased levels of greenhouse gases in the atmosphere can cause changes such as precipitation and temperature changes. In California, it is predicted that climate change could cause sea level rise, decrease the amount of snow in the Sierra snowpack, increase flooding, increase wildfires, and other impacts.

1.3 - Emissions Inventory

As shown in Table 1, in a "business as usual" scenario, emissions are anticipated to increase from 2009 levels in 2020 and buildout of the General Plan. A business as usual scenario examines the impact of growth without accounting for the strategies within this CAP or the benefits of state regulations and programs that reduce greenhouse gas emissions. With the reductions shown in this CAP, by the year 2020, per capita emissions are reduced at least 29 percent below 2020 business as usual levels.

Table 1: City of Hesperia Greenhouse Gas Emissions Summary

item	Greenhouse Gas Emissions ($MTCO_2e$)		
	2009	2020	Buildout
Business as Usual Emissions	639,419	954,648	1,256,312
Population (City and Sphere of Influence)	102,896	176,527	243,465
Business as Usual Per Capita Emissions	6.2	5.4	5.2
Emissions with Reductions from State Regulations and CAP Strategies	—	678,226	—
Per Capita Emissions with Reductions	—	3.8	—
Reduction Target	—	3.8	—

Notes:
$MTCO_2e$ represents the carbon dioxide equivalent in metric tons. Reductions at buildout are unknown at this time and 2009 emissions assume no reductions. For purposes of this analysis, it is assumed that buildout is in 2030, though the City anticipates actual buildout to be much later.
Source: Summarized from Section 3.

1.4 - Climate Action Plan Strategy

The CAP strategy is primarily based upon the land use, transportation, and conservation policies that are part of the General Plan Update, recent specific plans, and major development plans in the City. The concept is that design, density, and pattern of land uses impact the amount people drive and the options available for using less polluting and energy-consuming modes of transportation such as walking, bicycling, and transit. The plans also promote energy efficiency in buildings, government operations, and through more efficient water use. Implementation of these plans helps to ensure that the City will be developed in ways that produces fewer greenhouse gas emissions.

This CAP identifies policies within the City of Hesperia General Plan Update that would decrease the City's emissions of greenhouse gases. This CAP also lists implementation strategies that add more details and specific actions to the General Plan policies and clarify how the reductions would occur. This CAP demonstrates that the General Plan Update policies and CAP strategies would reduce emissions to the reduction target. The CAP includes strategies in the following categories:

- CEQA compliance
- Mixed use development
- Transit oriented development
- Compact development
- Pedestrian connections
- Bicycle infrastructure
- Traffic calming
- Parking measures
- Energy efficiency
- Water conservation and reuse
- Waste reduction and recycling
- Regional cooperation
- Government operations
- Climate change adaptation

SECTION 2: INTRODUCTION

The Climate Action Plan (CAP) is the City's primary strategy for ensuring that the buildout of the General Plan Update will not conflict with the implementation of Assembly Bill 32 – the Global Warming Solutions Act of 2006 and its goal of reducing California's greenhouse gas emissions to 1990 levels by the year 2020. The CAP provides strategies and implementation actions that will reduce community related and City operations-related greenhouse gas emissions by amounts that are consistent with AB 32 goals. The CAP is a companion document to the General Plan Update and implements the General Plan's greenhouse gas reduction policies.

This section provides a discussion of the environmental and regulatory context and the intended purpose and function of the CAP.

2.1 - City of Hesperia

The City of Hesperia ("City") is located off Interstate 15 (I-15) in the southwestern corner of San Bernardino County in an area known as the High Desert. The City of Hesperia

contains approximately 74.77 square miles of land area. The City is within the Mojave Desert Air Basin. It is bordered by Victorville to the north, the San Bernardino National Forest to the south, and unincorporated lands in San Bernardino County, as shown in Figure 1.

Although Hesperia was not incorporated until 1988, the City has a rich history. It is believed to be the original tribal headquarters of the Mojave Indians. Because of Hesperia's location at the headwaters of the Mojave River, the City served as a resting place for Spanish missionaries dating back to the 1700s. In 1885, upon completion of the area's first railroad depot, the area was officially named Hesperia. A local businessman acquired the township and formed the Hesperia Land and Water Company in the same year. In the late 19th century, the area was known for its abundant grape crops; in the 20th century, Hesperia was again a major rest stop since it was the final stop before the dreaded Cajon Pass. In 1924, Route 66 was realigned west of Hesperia and the City was no longer a major stopping point.

Hesperia's population grew relatively slowly until the completion of several major highways, including Routes 66, 91, 395, and I-15 in the 1940s and 1960s. After completion of these roads, suburban growth transformed the small town of 5,000 people in 1970 to a moderately sized community of over 60,000 by 2000. Hesperia remains a semi-rural community with a variety of housing opportunities, including custom-built villas, modern subdivisions with access to a variety of amenities, and large-lot residential zoning.

In January 2009, the City population was estimated to be 88,184, an increase of about 41 percent in the 8 years since the 2000 Census. The California Department of Finance reported an increase in average household size from 3.12 persons per household in 2000 to 3.26 persons in 2008. This could mean a trend towards larger families, or a trend towards extended families sharing living quarters. During this same period, the housing stock increased by 34 percent. Single-family homes make up about 84 percent of the housing stock, the multi-family share is about 11 percent, and mobile homes comprise the remaining 5 percent. The majority of the Hesperia housing stock is also relatively new, with only 10 percent of all housing units built before 1970. Over one-third of the housing stock is less than 10 years old (constructed since 2000). Most homes in the City are well maintained; however, some older units may be in need of nominal rehabilitation. Programs offered by the City to encourage rehabilitation will prevent deterioration.

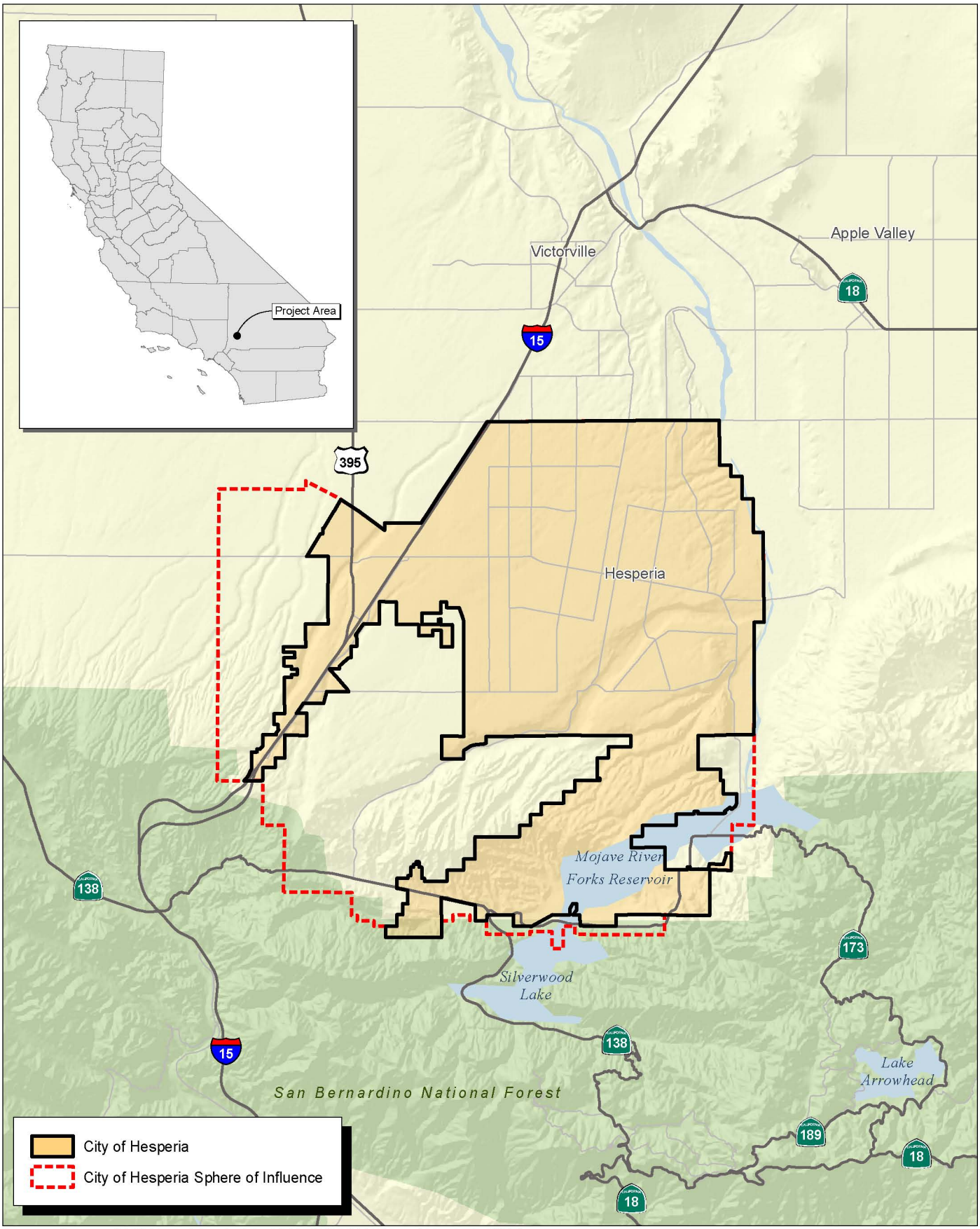
Demographic shifts are occurring in the City. In 1990, 77 percent of the population was White. The Hispanic share of the population was 19 percent, while Blacks made up about 2 percent of the City's residents. The 2000 Census documented an increase in Hispanic residents to 30 percent of the City population. The share of Black residents also increased to 4 percent.

Median home price in Hesperia was $185,000 in 2008, which dropped further to $136,500 in February 2009. Overall average rent in the City was estimated at $1,134 as of March 2009. Although lower-income households are able to afford a majority of the rental units in the City, most are not able to afford homeownership. Hesperia has been actively addressing its housing issues by developing affordable housing, improving the existing housing, and providing assistance to households in need. As part of this Housing Element update, the City will assess its current housing issues and cost-effectiveness of housing programs to ensure that an appropriate and effective housing strategy is developed for the 2008–2014 planning period.

Buildout from the implementation of the General Plan Update would result in an estimated 79,855 dwelling units, which will house 243,465 residents by buildout. This future population would represent an increase of approximately 140,569 residents over the current population. This future housing represents an increase of approximately 51,010 units or an increase of 177 percent.

Residential Development

Existing residential development within the City of Hesperia consists of predominantly single family detached housing on lots of one-half acre or larger. Most of the existing residential lots are located within the core area of the town, generally bounded by Maple Avenue and the Mojave River, and by Bear Valley Road and Ranchero Road. Within this core area, the majority of residential lot sizes have traditionally ranged from 18,000 square feet to 1 acre.



Source: Census 2000 Data, The CaSIL, MBA GIS 2010, City of Hesperia 2009.

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NORTH

5 2.5 0 5 Miles

Figure 1
Regional Location Map

Since incorporation, the City has approved and continues to receive subdivision applications for lot sizes below the traditional 7,200-square-foot lots. These projects have generally been located in the areas west of Maple Avenue and east of the I-15 freeway. Densities of 4 to 6 units per acre have been approved on several tentative tracts, with requirements for upgraded roads; water and sewer service; and contributions to fire, school, and park services. The Mission Crest development added over 1,000 single-family dwelling units, the majority of which are on lots of fewer than 7,200 square feet. Easier access to the freeway and un-subdivided land facilitate these projects, which appear to be targeted towards first-time homebuyers and commuters. It is expected that single-family residential tracts of 4 to 6 units per acre will continue to be proposed in the areas between I-15 and Maple Avenue, until the area is built out.

Large expanses of land within the core area of the City were subdivided into half-acre, acre, and two-acre tracts. The area located south of Main Street, west of Hickory Avenue, east of Maple Avenue, and north of Muscatel Street has seen numerous applications to subdivide single parcels into two smaller parcels. The previous zoning map identified the area for a minimum 2.5-acre lot size, with scattered subdivisions of parcels through spot zone changes. As a result, this General Plan map identifies this entire area for lot sizes of a minimum of 1 acre.

Multiple-family residential uses have been established in three general areas within the community. An extensive area east of the Santa Fe Railroad and south of Main Street, extending along C Avenue and G Avenue, was designated on the County zoning map for R-3 (Multiple Family Residential) uses prior to City incorporation. This area has remained multi-family and has developed with several mobile home parks and apartment projects. In addition, several affordable housing projects have been proposed and approved within this area. The Multi-Family Residential designation permits development at a density of 8.0 to 15.0 dwelling units per acre (du/ac), but the area has developed with single-family residences on one lot because the lack of infrastructure and lot size has limited the number of units per acre. Single-family residences are mixed in with duplexes and triplexes through most of this area. Consequently, linear design and lack of open space or amenities characterize these developments.

Specific Plans

The City of Hesperia has adopted three specific plans—Summit Valley Ranch, Rancho Las Flores, and Main Street and Freeway Corridor. The City anticipates much of its future residential growth will occur in these specific plan areas, which upon buildout will add over 44,000 new housing units to the City.

Rancho Las Flores Specific Plan: The Rancho Las Flores Specific Plan is a 9,867-acre development distributed across eight “villages” and open spaces. These eight villages offer

diverse residential options and are complemented with commercial uses, schools, parks, and other public uses. The Specific Plan proposes single-family housing as well as attached housing and has an anticipated capacity of 16,980 housing units. Five residential land use designations and one mixed-use designation are included in the Specific Plan, and allowable densities range from 1 unit per acre (Very Low Density Residential) to 30 units per acre (Town Center Residential).

In addition to conventional lot-by-lot development, the Specific Plan encourages planned concept housing development for detached housing in the Medium Density, Medium-High Density, and Town Center (Mixed-Use) designations. Planned concept housing development is intended to provide an alternative to the development and maintenance of higher-density detached residential dwellings and includes such characteristics as alley-loaded units, zero-lot line units, cluster housing, and garden courts.

Summit Valley Ranch Specific Plan: In October 1997, the City adopted the Summit Valley Ranch Specific Plan, which encompasses approximately 788 acres. The Specific Plan, as adopted, allows for a maximum of 1,688 dwelling units on approximately 281 acres. Allowable residential densities range from approximately 4 units per acre (single-family residences) to 19 units per acre (apartments). In addition, the Plan envisions a school site, passive and active parks for residents, convenience commercial, office professional uses, a school site, and a golf course/country club facility for a total of 265.5 acres. The balance of the project, approximately 233.1 acres, is intended to remain natural open space, and it will address major slopes and provide for public and private roads. The development of the Summit Valley Ranch Specific Plan is also tied to the infrastructure development of the Rancho Las Flores project to the east.

Main Street and Freeway Corridor Specific Plan: The purpose of this Specific Plan is to establish a development framework for the City's Main Street and Freeway corridors. The Plan also sets forth a strategy for public investment and improvements along the corridor, including circulation, parking, parks and streetscape improvements. The Specific Plan area consists of two corridors, Interstate-15 and Main Street, approximately 18 miles in length and with a total area of over 16 square miles. The Main Street corridor extends from I Avenue on the east to about a mile west of the interchange at the Interstate-15 Freeway. The Freeway corridor extends between the northern and southern city limits. The Specific Plan area is almost 80 percent vacant or underdeveloped. The Main Street and Freeway Corridor Specific Plan was adopted in October of 2008.

The Specific Plan area contains three single-family residential land use designations–Low Density Residential, Very Low Density Residential, and Rural Residential. Two multi-family residential zones, Medium Density Residential and High Density Residential, are also included in the Specific Plan. A zone that permits mixed-use development in the area

adjacent to the Civic Center has also been established to provide the opportunity for live/work uses in an environment that is otherwise typically residential in character.

The City's Role in Reducing Emissions

The City's focus is on emission sources within its regulatory authority, which are mainly related to land use and the local transportation system. To some extent, the City can influence activities that reduce greenhouse gases, such as water conservation, solid waste diversion, and recycling. The City can require feasible mitigation measures for new projects as a Lead Agency under the California Environmental Quality Act (CEQA).

2.2 - Mojave Desert Air Quality Management District

The City of Hesperia is within the jurisdiction of the Mojave Desert Air Quality Management District (District). The District has jurisdiction over the desert portion of San Bernardino County and the far eastern end of Riverside County. This region includes the incorporated communities of Adelanto, Apple Valley, Barstow, Blythe, Hesperia, Needles, Twentynine Palms, Victorville, and Yucca Valley. This region also includes the National Training Center at Fort Irwin, the Marine Corps Air Ground Combat Center, the Marine Corps Logistics Base, the eastern portion of Edwards Air Force Base, and a portion of the China Lake Naval Air Weapons Station.

Under the California Environmental Quality Act (CEQA), the District is a commenting agency on air quality and related matters within or impacting its jurisdiction. Under the Federal Clean Air Act, the District has adopted federal attainment plans for ozone and particulate matter less than 10 microns in diameter (PM_{10}). The District reviews CEQA projects to ensure that they will not (1) cause or contribute to any new violation of any air quality standard, (2) increase the frequency or severity of any existing violation of any air quality standard, or (3) delay timely attainment of any air quality standard or any required interim emission reductions or other milestones of any federal attainment plan. The District does not have any guidance regarding CAPs or greenhouse gases at this time.

2.3 - Purpose

This CAP has been designed to support these primary functions:

- Outline a course of action for the City government and the community of Hesperia to reduce per capita greenhouse gas emissions 29 percent below business as usual by 2020 and adapt to effects of climate change.
- Provide clear guidance to City staff regarding when and how to implement key provisions of the CAP. This CAP sets out an implementation and monitoring framework for monitoring its strategies.

The CAP addresses both City emissions (such as emissions from City vehicles) and community emissions (such as emissions from the electricity generated to power residences within the City). The CAP is a companion to the General Plan that builds on the General Plan's framework with more specific actions that will be applied to achieve emission reduction targets consistent with California legislation. The terms Climate Action Plan and Greenhouse Gas Reduction Plan are often used interchangeably. Climate Action Plan (abbreviated as CAP) is used for this document.

The CAP follows a series of guiding principles to ensure that it is consistent with the City's values, objectives, and economy.

- The CAP will focus on strategies that meet multiple City objectives and enhance the quality of life and well-being of City residents.
- CAP strategies that provide an economic return will receive a higher priority than strategies that increase costs for the City, businesses, or residents.
- The CAP will not duplicate strategies and programs that are better handled by other agencies.
- The CAP recognizes that federal, state, and other agency requirements set for local government regarding greenhouse gas reductions and climate change are evolving, so strategies and targets must be adaptable to changing conditions.
- CAP implementation and monitoring will use existing data collection and reporting systems to the maximum extent possible.

Amended CEQA Guidelines

This CAP follows the suggested plan elements in Section 15183.5 in the CEQA Guidelines, Tiering and Streamlining the Analysis of Greenhouse Gas Emissions, which states the following:

> (b) Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.

(1) Plan Elements. A plan for the reduction of greenhouse gas emissions should:

(A) Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;

(B) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;

(C) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;

(D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;

(E) Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels;

(F) Be adopted in a public process following environmental review.

(2) Use with Later Activities. A plan for the reduction of greenhouse gas emissions, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects. An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. If there is substantial evidence that the effects of a particular project may be cumulatively considerable notwithstanding the project's compliance with the specified requirements in the plan for the reduction of greenhouse gas emissions, an EIR must be prepared for the project.

California Attorney General's Office Recommendations

Consistent with the California Attorney General's Office recommendations (2009), this CAP includes the following components:

- Emissions inventory (to assist in developing appropriate emission targets and mitigation measures)
- Emission targets that apply at reasonable intervals through the life of the plan
- Enforceable greenhouse gas control measures

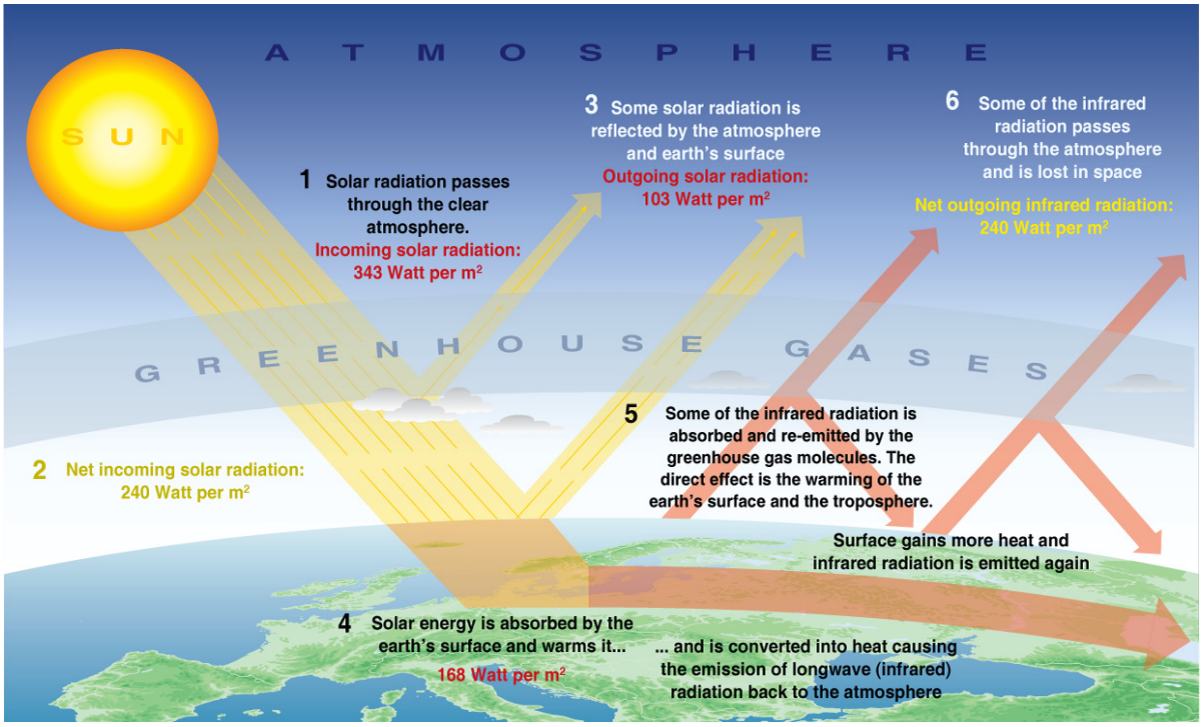
- Monitoring and reporting (to ensure that targets are met)
- Mechanisms to allow for the revision of the plan, if necessary, to stay on target

The Attorney General's Office further recommends that if a city or county intends to rely on a CAP as a centerpiece of its mitigation strategy, it should prepare the CAP at the same time as its general plan update and EIR. This is consistent with CEQA's mandate that a lead agency must conduct environmental review at the earliest stages in the planning process and that it not defer mitigation. In addition, the Attorney General's Office strongly urges agencies to incorporate CAPs into their general plans to ensure that their provisions are applied to every relevant project.

2.4 - Climate Change Science

Gases that trap heat in the atmosphere are referred to as greenhouse gases. The effect is analogous to the way a greenhouse retains heat, as shown in Figure 2.

Figure 2: The Greenhouse Effect

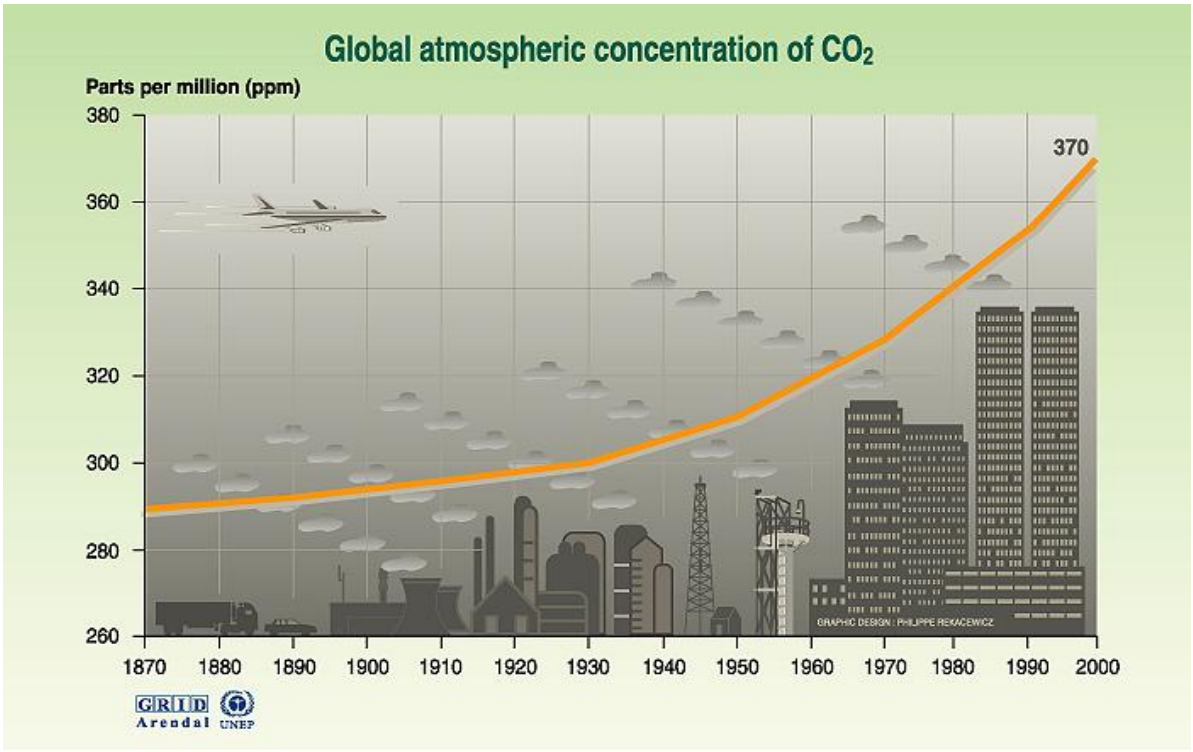

ATMOSPHERE
SUN
1 Solar radiation passes through the clear atmosphere.
Incoming solar radiation: 343 Watt per m²
3 Some solar radiation is reflected by the atmosphere and earth's surface
Outgoing solar radiation: 103 Watt per m²
6 Some of the infrared radiation passes through the atmosphere and is lost in space
Net outgoing infrared radiation: 240 Watt per m²
GREENHOUSE GASES
5 Some of the infrared radiation is absorbed and re-emitted by the greenhouse gas molecules. The direct effect is the warming of the earth's surface and the troposphere.
2 Net incoming solar radiation: 240 Watt per m²
Surface gains more heat and infrared radiation is emitted again
4 Solar energy is absorbed by the earth's surface and warms it...
168 Watt per m²
... and is converted into heat causing the emission of longwave (infrared) radiation back to the atmosphere

Greenhouse gases include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Natural processes and human activities emit greenhouse gases. The presence of greenhouse gases in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of greenhouse gas, the earth's surface would be about 34 degrees Centigrade cooler. Carbon dioxide concentrations in the atmosphere have steadily increased over time, as shown in Figure 3. Global atmospheric

concentration of carbon dioxide (CO_2) data in Figure 4 prior to 1958 are from ice core measurements, and post-1958 data are from the Mauna Loa measurement site in Hawaii.

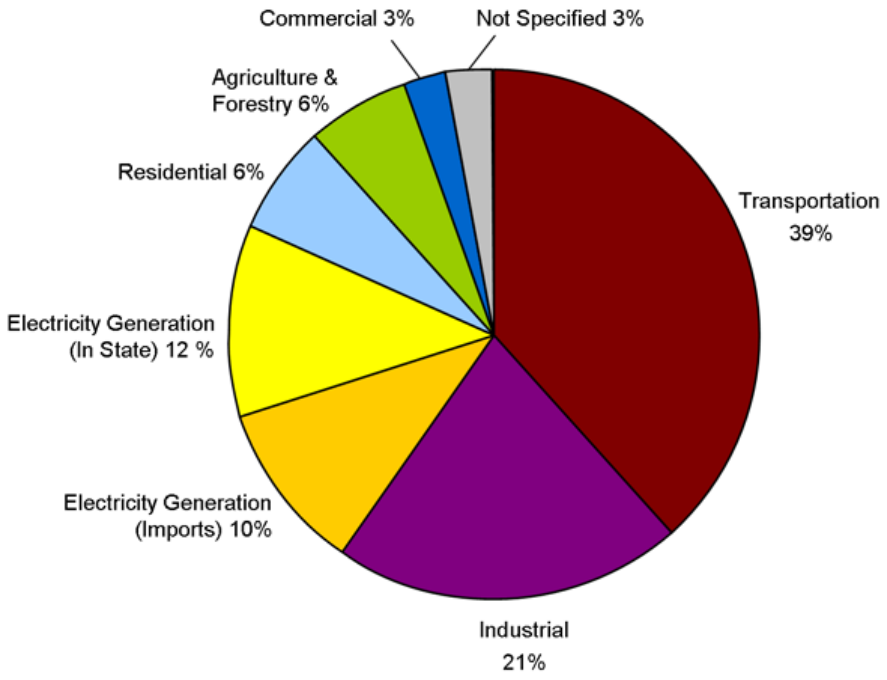
Greenhouse gases have varying global warming potential and atmospheric lifetimes. Carbon dioxide, the reference gas for global warming potential, has a global warming potential of one. The calculation of the carbon dioxide equivalent (CO_2e) is a consistent methodology for comparing greenhouse gas emissions, since it normalizes various greenhouse gas emissions to a consistent metric. Methane's warming potential of 21 indicates that methane has a 21 times greater warming affect than carbon dioxide on a molecule per molecule basis. A carbon dioxide equivalent is the mass emissions of an individual greenhouse gas multiplied by its global warming potential. Emissions are typically shown in metric tons of carbon dioxide equivalents ($MTCO_2e$) or a million times that, million metric tons of carbon dioxide equivalents ($MMTCO_2e$). As shown in Figure 4, greenhouse gas emissions in California in 2006 were approximately 483.9 $MMTCO_2e$.

Figure 3: Global Atmospheric Concentration of CO_2



Sources: TP Whorf Scripps, Mauna Loa Observatory, Hawaii, institution of oceanography (SIO), university of California La Jolla, California, United States, 1999

Figure 4: California Greenhouse Gas Emissions in 2006 (Gross Emissions=483.9 MMTCO$_2$e)



2.5 - California Regulatory Context

California has adopted a variety of regulations aimed at reducing the State's greenhouse emissions. While state actions alone cannot stop climate change, the adoption and implementation of this legislation demonstrates California's leadership in addressing this challenge. Key legislation pertaining to the State's reduction targets are described below.

AB 32. The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires that greenhouse gases emitted in California be reduced to 1990 levels by the year 2020. "Greenhouse gases" as defined under AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The California Air Resources Board (ARB) is the state agency charged with monitoring and regulating sources of greenhouse gases.

The ARB approved the Climate Change Scoping Plan in December 2008. The Scoping Plan contains measures designed to reduce the State's emissions to 1990 levels by the year 2020. Local governments must achieve reductions through land use measures that will be substantially dependent on the General Plan for success. Statewide, the ARB expects to target local governments with reducing greenhouse gas emissions by 5 MMTCO$_2$e by 2020.

Executive Order S-3-05. California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S 3-05, the following reduction targets for greenhouse gas emissions:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020, reduce greenhouse gas emissions to 1990 levels;
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

Executive Order S-13-08 directs the Governor's Office of Planning and Research, in cooperation with the California Resources Agency, to provide land use planning guidance related to sea level rise and other climate change impacts. The order also directs the California Resources Agency to develop a State Climate Adaptation Strategy by June 30, 2009 and to convene an independent panel to complete the first California Sea Level Rise Assessment Report.

Senate Bill (SB) 375. SB 375 aligns regional transportation planning efforts, regional greenhouse gas reduction targets, and affordable housing allocations. Metropolitan Planning Organizations are required to adopt a Sustainable Communities Strategy, which allocates land uses in the Metropolitan Planning Organization's Regional Transportation Plan. Qualified projects consistent with an approved Sustainable Communities Strategy or Alternative Planning Strategy and categorized as "transit priority projects" would receive incentives under new provisions of CEQA.

SECTION 3: EMISSION INVENTORY

This section describes the process of developing a greenhouse gas emission inventory and provides an inventory of the sources of greenhouse gas emissions for Hesperia.

3.1 - Emission Inventory Overview

Greenhouse gas inventories consider a wide range of human activities. Estimating the amount of greenhouse gases generated by these activities requires using a multiplicity of data sources and a diverse set of methodologies. Emission inventories are by nature the reflection of the best available data and the most applicable methods at the time of their compilation. As data grows and understanding develops, the inventories can be updated and improved.

Emissions inventories are organized by source categories or sectors. The State of California organizes its emission inventory by the following sectors: transportation, electricity, commercial and residential, industry, recycling and waste, high global warming potential gases, and agriculture. This inventory provides emission estimates for all of the sectors except for agriculture and industry. Hesperia has very limited agriculture and industrial sources and the emissions from energy use from these sources are included in the commercial sector. The inventory is based on the emissions of a number of greenhouse gases. Although carbon dioxide is the largest contributor to climate change, AB 32 also defines the following as greenhouse gases: methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. The emissions of each gas are standardized by the global warming potential in comparison to CO_2 and is referred to as CO_2 equivalent or CO_2e.

3.2 - Hesperia Inventory

Community Emissions

This assessment presents the estimated greenhouse gas emissions generated in the City of Hesperia for calendar year 2009, as well as the projected Hesperia emissions for calendar years 2020 and buildout of the General Plan. The inventories for the years 2020 and buildout are based on an interpolation of General Plan Update buildout data assuming steady growth each year. See Appendix A for supporting documentation for the emission inventories.

This assessment includes emissions attributable to all land within the City of Hesperia. Therefore, Hesperia is considered the organizational boundary for the assessment. The assessment includes emission inventories for five main sectors of emission sources:

electricity, natural gas, solid waste, refrigerants, and transportation sources. Therefore, these sectors are considered the operational boundary for the assessment.

When data from 2009 was unavailable, data from other years were used as a proxy. Buildout year projections assume a business-as-usual trajectory for generation and emission of greenhouse gases in the City.

The emissions by sector for the years 2009, 2020, and buildout are presented in Table 2 and are summarized graphically in Figure 5. A 2020 emissions breakdown is shown in Figure 6.

Table 2: City of Hesperia Community Business as Usual Emissions

Community Sector	Greenhouse Gas Emissions ($MTCO_2e$ per year)		
	2009	2020	Buildout
Transportation: Automobiles, Light Duty Trucks, Medium Duty Trucks	199,414	249,365	302,008
Transportation: Heavy Duty Diesel Trucks	200,392	250,587	303,488
Transportation: Other	7,454	9,321	11,288
Natural Gas	34,507	87,734	136,118
Electricity	135,824	233,019	321,378
Solid Waste	28,394	48,713	67,184
Wood burning fireplaces and stoves	9,528	16,073	22,023
Refrigerants	23,906	59,836	92,825
Total	**639,419**	**954,648**	**1,256,312**
Population	102,896	176,527	243,465
Per Capita Emissions	6.2	5.4	5.2

Notes:
$MTCO_2e$ represents the carbon dioxide equivalent in metric tons, which accounts for the global warming potential of greenhouse gases such as methane and nitrous oxide. For purposes of this analysis, the buildout year is assumed to be 2030, though the City believes this will be much later.
Source: Michael Brandman Associates, Appendix A.

There are various limitations to the emissions calculations. The transportation emissions were calculated based on assumptions from the California Department of Transportation public road data and emission factors from the EMFAC BURDEN model. Actual natural gas usage is not available; therefore, assumptions are based on generalized usage rates.

Electricity used in the City of Hesperia was obtained from Southern California Edison (see Appendix B) and was converted to emissions using general California emission factors. The electricity emissions include electricity required to pump and treat water. The electricity

usage data includes a category for agricultural pumping and consisted of 7 percent of 2009 electricity use. This category includes some but not all of the electricity required to pump water; therefore, electricity to pump and treat water was not segregated in the inventory.

Figure 5: Hesperia Community Greenhouse Gas Business as Usual Emissions

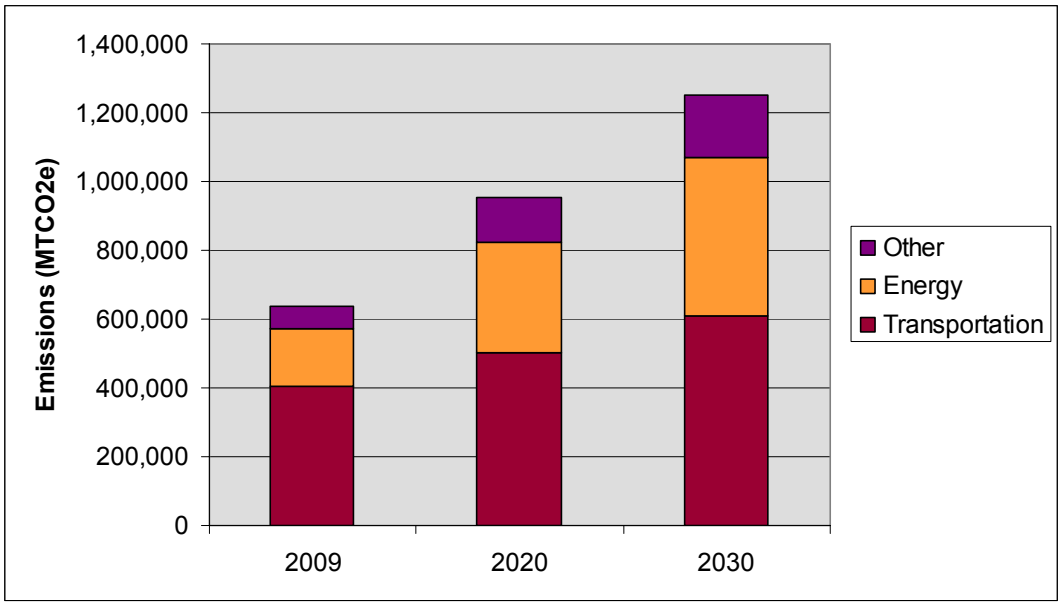
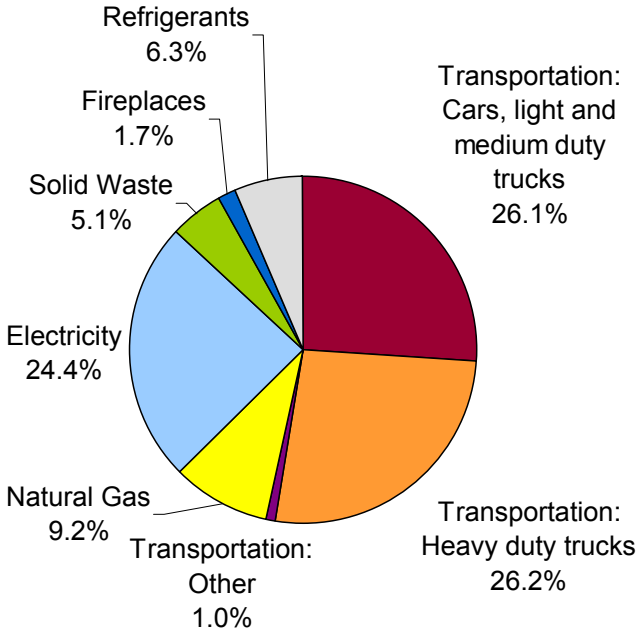


Figure 6: Hesperia Community 2020 Emissions



Per capita emissions are presented graphically in Figure 7. As discussed in Section 3.3, the reduction target for the City is also on a per capita basis and is shown in the figure. The reduction target is calculated by subtracting 29 percent from the 2020 business as usual per capita emissions.

Figure 7: Hesperia Business as Usual Per Capita Emissions

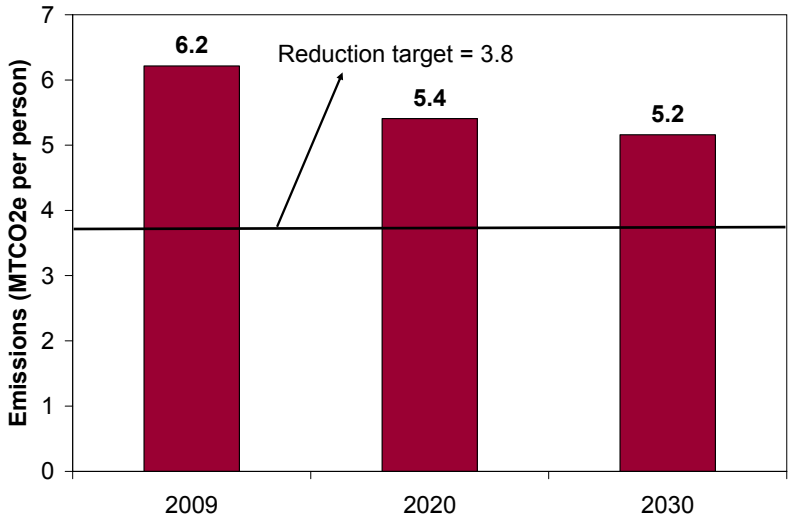


Table 3 contains a reduction summary of 2020 emissions. As shown in the table, with reductions from statewide measures and CAP strategies (see Section 3.5 and Section 4), per capita emissions meet the reduction target.

Table 3: City of Hesperia 2020 Reduction Summary

Year 2020	2020 Emissions ($MTCO_2e$)
Business as Usual Emissions (Community)	954,648
Reductions from Statewide Measures (23.7% of business as usual)	226,251
Reduction from CAP Strategy CAP-1 (8% of difference between 2009 and 2020 emissions, or 12 percent of 67 percent of new development)	25,218
Reductions from other CAP Strategies	24,953
Community Emissions with Reductions	**678,226**
Population	176,527
Per Capita Emissions, with Reductions	3.8
Reduction Target Per Capita Emissions	3.8
Do 2020 Emissions Meet Target?	Yes

Notes:
$MTCO_2e$ represents the carbon dioxide equivalent in metric tons, which accounts for the global warming potential of greenhouse gases such as methane and nitrous oxide.
Data compiled by Michael Brandman Associates, see Appendix A.
Reductions from Statewide Measures are calculated as shown in Table 6.

Hesperia City Government Electricity Emissions

Table 4 provides the greenhouse gas emissions from electricity generation for City of Hesperia government operations. Note that the City would also have emissions from transportation, refrigerant leakage, and natural gas consumption, but these were not estimated due to lack of data. Compared with the community wide electricity emissions, the City related electricity emissions in 2009 represents 0.58 percent of the entire City's 2009 electricity emissions.

Table 4: City of Hesperia Electricity Emissions

Source	Emissions ($MTCO_2e$)	
	2007	2009
Library, City Hall, and related buildings	465	497
Street lighting	70	67
Animal control buildings	48	46
Offices	76	45
Other	9	18
Total	**668**	**674**

Source: Michael Brandman Associates, Appendix A.
Notes: $MTCO_2e$ represents the carbon dioxide equivalent in metric tons, which accounts for the global warming potential of greenhouse gases methane and nitrous oxide.

3.3 - Reduction Target

Reduction target: Reduce per capita emissions 29 percent below business as usual emission levels by the year 2020.

Many factors were considered when selecting Hesperia's reduction target. The City strove to choose a target that is both aggressive and achievable given local circumstances. Local factors considered in selecting the target reduction percentage included estimation of the effects of implemented and planned programs and policies, an approximate assessment of future opportunities to reduce emissions, targets adopted by peer communities, and emissions reductions expected to be achieved by state-level climate policy. The CAP has a reduction target of 29 percent below 2020 business as usual. To reach this target, Hesperia and the State must reduce annual emissions by approximately 1.6 $MTCO_2e$ per person from baseline levels.

The basic concept of a reduction target is that a jurisdiction would provide reductions for the source categories over which it has jurisdiction that are at least as great as the reductions

required to meet the State's goal of reducing emissions to 1990 levels by 2020. The authority to control emissions from many of these sources is shared by multiple jurisdictions. In those cases, it is appropriate to allocate a portion of the reduction target to each jurisdiction. For example, the State's fuel and vehicle efficiency regulations will reduce mobile source emissions, but the County can also provide mobile source reductions through land use patterns and transportation system designs that reduce vehicle trips and miles traveled.

The ARB Scoping Plan states, "The 2020 goal was established to be an aggressive, but achievable, mid-term target, and the 2050 greenhouse gas emissions reduction goal represents the level scientists believe is necessary to reach levels that will stabilize climate." The year 2020 goal of AB 32 corresponds with the mid-term target established by S-3-05, which aims to reduce California's fair-share contribution of greenhouse gases in 2050 to 80 percent below 1990 levels that will stabilize the climate.

The ARB estimated California's business as usual emissions in 2020 at approximately 600 $MMTCO_2e$ and 1990 emissions in California at 427 $MMTCO_2e$ (ARB 2007). Therefore, an approximate 29 percent reduction from business as usual is required to reduce emissions to 1990 levels.

To reduce emissions by 80 percent below 1990 levels, substantial emission reductions would need to occur in California, such as a conversion to alternative energy generation, conversion to electric and/or zero emission motor vehicles, and substantial changes to land use patterns and transportation. The objective of this CAP is to provide Hesperia's contribution to achieving the initial target and to provide the framework for future reductions as technology advances.

The analysis also demonstrates consistency with the ARB Scoping Plan reduction targets in 2020. The two largest sources over which the City has jurisdiction, mobile sources and energy use, will see substantial emission reductions from state regulations on fuel efficiency in motor vehicles and energy efficiency in buildings. If state reductions were not counted, future year emissions would be greatly overstated. The Scoping Plan only calls for an incremental reduction in excess of the actions in the Scoping Plan measures to achieve the 2020 target. Regional transportation measures, transit improvements, transportation demand management enhancements, and voluntary energy retrofits will provide reductions to all existing and new development.

For fast-growing cities like Hesperia, a per capita reduction target is most appropriate to account for the fact that it is absorbing a larger percentage of regional growth compared with other parts of California. Based on General Plan buildout of 243,465 (assumed to be 2030 for purposes of this analysis, though the City believes it to be much later) and the 2009 population of 102,896 (including the sphere of influence), the City would add about 6,700

people per year. By 2020, the population would increase by 73,600 or 72 percent. The per capita emissions for existing and new development are predicted to decline by 2020, due to the implementation of state regulations.

For the City to achieve its reduction target, it will need to achieve an overall reduction in new and existing development in excess of current regulations. Some new development will not require new entitlements to proceed with construction. The City indicates that all new single family homes on existing lots will be subject to discretionary review, which is probably over 80 percent of new development. Those projects would need to achieve a 12-percent reduction in order for the City to achieve an overall reduction beyond state regulations. Some projects that do not require a new entitlement may still provide reductions if they voluntarily exceed standards to provide a project amenity or to respond to market forces demanding more energy efficiency and better transportation options. Voluntary reductions are not used to develop the target.

Based on this approach, if a project chooses to rely on compliance with this CAP to achieve a less than significant impact, the project must demonstrate a 12-percent reduction without accounting for state regulations. The CAP strategy provides an average reduction of 12 percent from all development requiring new entitlements that will occur in implementing the General Plan Update. Voluntary reductions may achieve additional reductions that will provide the City with a margin of safety over and above the target.

3.4 - Strategy Reduction Summary

Providing a high-density housing development that is not adjacent to necessary and compatible service and uses and has no transit service will generate limited reductions. Place high-density housing within walking distance of high-quality transit service and frequently accessed destinations, and the reductions in travel are substantial. According to the Caltrans Statewide Transit Oriented Development Study (Caltrans 2002), transit oriented development can increase transit usage by 20 to 40 percent for those living, working, and/or shopping near transit stations. It is important to consider this wide range of differences in travel when attempting to predict the effect of the City's land use strategy on future travel.

Table 5 summarizes the emission reductions from the CAP strategies (see Section 4: Climate Action Strategies).

Table 5: Community Emission Reductions from CAP Strategies

Inventory Sector	CAP Strategy	High End Reduction Potential (%)[1]	Hesperia Reduction (%)
Transportation	CAP-1, CEQA Compliance	Varies	12 from new[2]
	CAP-2, Mixed Use Development	30	0.2
	CAP-3, Transit Oriented Development	40	0.2
	CAP-4, Compact Development	40	0.2
	CAP-5, Pedestrian Connections	10	0.6
	CAP-6, Bicycle Infrastructure	5	1.0
	CAP-7, Traffic Calming	10	0.2
	CAP-8, Parking Measures	30	0.2
	Subtotal: Transportation	—	12 from new[2] 2.6 (existing)
Energy Efficiency	CAP-1, CEQA Compliance	Varies	12 from new[2]
	CAP-9, Energy Efficiency	Varies	*
	Subtotal: Energy Efficiency	—	12 from new[2]
Waste	CAP-11, Waste Reduction and Recycling	Varies	Varies
Water	CAP-10, Water Conservation and Reuse	Varies	20

Notes:
[1] CAPCOA 2008, Caltrans 2002, and Ewing et al. 2007
[2] This reduction is from new development only
* Reductions are accounted for in the Reductions from State Scoping Plan Measures

3.5 - Reductions from State Scoping Plan Measures

The future year inventories do not include reductions from state measures that will go into effect prior to the inventory 2020 target year and the General Plan buildout year. California has a very aggressive program that was adopted in the ARB Scoping Plan in 2008. Many of the measures have already been adopted as state regulations and others are scheduled for adoption by 2012. The following describes the state greenhouse gas reduction strategy and provides emission reduction estimates for the state strategies. Also provided is an estimate of the reductions that the state regulations will have on sources in the Hesperia emissions inventory.

Key elements of California's strategy for reducing its greenhouse gas emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewable energy mix of 33 percent
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets (SB 375)
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation

The ARB Scoping Plan identifies measures designed to reach the State's 2020 target and provides emission reduction estimates for each measure. The following describes the primary statewide measures that apply to development related emissions in Hesperia.

Motor Vehicles - Pavley Standards: The EPA recently granted the waiver for California for its greenhouse gas emission standards for motor vehicles. The Pavley I (AB 1493) regulation, which has already been adopted by ARB, requires greenhouse gas emission reductions from passenger cars and light trucks up to the 2016 model year. This regulation is expected to provide 27.7 $MMTCO_2e$ of emission reductions in 2020. The Pavley I standards are expected to reduce total emissions for automobiles and light trucks by 17.2 percent relative to the business as usual scenario (without Pavley or corporate average fuel economy) by the year 2020. ARB is currently developing standards for passenger vehicles model year 2017 and later that is being referred to as Pavley II. That regulation will also provide reductions by 2020. The new standards will follow up on the existing standards that reach maximum stringency in 2016. The Scoping Plan indicates that the Pavley II standards will achieve additional emission reductions of 4.1 $MMTCO_2e$ by 2020. The Pavley I and II standards are expected to reduce total emissions for automobiles, light trucks, and medium duty vehicles by 19.7 percent relative to the business as usual scenario (without Pavley or corporate average fuel economy) by the year 2020.

Motor Vehicles - Low Carbon Fuel Standard: ARB adopted a new regulation in December 2009 to implement this standard. The regulation is a discrete early action measure under AB 32 and implements Governor Schwarzenegger's Executive Order S-01-07. The ARB

Scoping Plan estimates this regulation will provide 15 $MMTCO_2e$ of emission reductions in 2020. The Low Carbon Fuel Standard is expected to reduce total emissions from passenger vehicles and heavy-duty trucks by 7.2 percent. A 7.2-percent reduction from business as usual emissions for all vehicles and trucks is taken for this regulation.

Motor Vehicles - Passenger Vehicle Efficiency: ARB identified several measures that would further reduce tailpipe greenhouse gas emissions from passenger vehicles by increasing vehicle efficiency. These measures include ensuring proper tire inflation and using solar-reflective automotive paint and window glazing (cool car standards). The ARB Scoping Plan estimates these regulations will provide 4.5 $MMTCO_2e$ of emission reductions in 2020. These measures are expected to reduce total emissions from passenger vehicles by 2.8 percent from automobiles, light-duty trucks, and medium-duty trucks. Details regarding the current status of these initiatives are provided below.

- ARB approved a regulation that requires California's automotive maintenance industry to check the tire pressure of every vehicle they service in March 2009. A properly inflated tire helps to reduce fuel greenhouse gas emissions by reducing tire-rolling resistance.
- Following the June 2009 Board adoption of the cool cars regulation, stakeholders raised several new issues involving performance of electronic devices as they may affect public safety. After listening to this input and accounting for the legal deadline to finalize the rule, the AB 32 "cool cars" rulemaking will cease. Instead, the ARB will pursue a performance-based approach as part of its vehicle climate change program to reduce emissions from air conditioning and provide cooler car interiors for California motorists.
- Additional measures that would further reduce tailpipe greenhouse gas emissions from passenger vehicles by increasing vehicle efficiency include low friction oil and a tire tread program. The ARB Scoping Plan estimates these regulations will provide 3.1 $MMTCO_2e$ of emission reductions in 2020.

Motor Vehicles, Heavy Duty Truck Vehicle Efficiency (Aerodynamic Efficiency): ARB approved this regulation in December 2008. This measure requires existing trucks/trailers to be retrofitted with the best available technology and/or ARB-approved technology. Technologies that reduce greenhouse gas emissions and improve the fuel efficiency of trucks may include devices that reduce aerodynamic drag and rolling resistance. The requirements apply to California and out-of-state registered trucks that travel to California. The 2020 estimated greenhouse gas emission reductions are about 0.93 $MMTCO_2e$. This regulation is expected to reduce total emissions from heavy-duty trucks by 2.9 percent.

Natural Gas Energy Efficiency: The ARB Scoping Plan Energy Efficiency measure includes a number of actions that reduce energy consumption of both natural gas and electricity through improvements in building and appliance efficiency and through efficiency in combustion of the natural gas. Examples of efficiency improvements include the use of condensing heaters; tankless, gas-fired, on-demand heaters; and other super efficient, gas-fired heating appliances that will replace less efficient water and space heaters by attrition as they fail. The 2020 emission reductions from this measure are 4.3 $MMTCO_2e$ or 9.4 percent of the inventory for this source category.

Renewable Energy Portfolio Standard: The California Energy Commission estimates that about 12 percent of California's retail electric load is currently met with renewable resources. Renewable energy includes (but is not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas. California's current Renewables Portfolio Standard was intended to increase that share to 20 percent by 2010. Increased use of renewables will decrease California's reliance on fossil fuels, thus reducing emissions of greenhouse gases from the Electricity sector. Based on Governor Schwarzenegger's call for a statewide 33-percent Renewables Portfolio Standard, the Scoping Plan anticipates that California will have 33 percent of its electricity provided by renewable resources by 2020, and includes the reduction of greenhouse gas emissions based on this level. Hesperia is served by Southern California Edison. In 2008, Southern California Edison provided 16 percent of its electricity from renewable resources. Reaching a target of 33 percent would result in a reduction of 17 percent from emissions.

Electrical Efficiency: The Scoping Plan lists 12 strategies to maximize energy efficiency that are expected to achieve a savings of up to 40,000 gigawatt-hours of electricity by 2020. The Scoping Plan estimates electrical efficiency measures would reduce emissions in this source category by 15.2 $MMTCO_2e$ by 2020. With the implementation of the following strategies, emission reductions of 15.7 percent would be achieved:

- "Zero Net Energy" buildings
- More stringent building codes and appliance standards
- Broader standards for new types of appliances and for water efficiency
- Improved compliance and enforcement for existing standards
- Voluntary efficiency and green building targets beyond mandatory codes for Existing Buildings
- Voluntary and mandatory whole-building retrofits for existing buildings
- Innovative financing to overcome first-cost and split incentives for energy efficiency, onsite renewables, and high efficiency distributed generation

- Improved utility program strategies
- More aggressive utility programs to achieve long-term savings
- Water system and water use efficiency and conservation measures
- Local government programs that lead by example and tap local authority planning, development, and code compliance
- Additional industrial and agricultural efficiency efforts
- Providing real time energy information to help consumers conserve and optimize energy performance

Million Solar Roofs: As part of Governor Arnold Schwarzenegger's Million Solar Roofs Program, California has set a goal to install 3,000 megawatts of new, solar capacity by 2017—moving the State toward a cleaner energy future and helping lower the cost of solar systems for consumers. The Million Solar Roofs Program is a ratepayer-financed incentive program aimed at transforming the market for rooftop solar systems by driving down costs over time. Created under Senate Bill 1 (Murray, Chapter 132, Statutes of 2006), Million Solar Roofs builds on previous ratepayer-funded programs and provides up to $3.3 billion in financial incentives that decline over time.

Methane from Landfill Waste: The proposed ARB Regulation, Reduce Methane Emissions from Municipal Solid Waste Landfills, which is due to be adopted in early 2010, will enhance capture and control of methane from municipal waste landfills. ARB estimates that the regulation will reduce methane emissions at existing landfills with methane capture systems and combustion by an additional 14.2 percent.

Refrigerants, Regulations: On December 9, 2009, the ARB adopted the Management of High Global Warming potential Refrigerants for Stationary Sources in the California Code of Regulations. Beginning in 2011, the rule will require leak inspection, repairs, required service practices, and recordkeeping for large commercial and industrial systems that use more than 50 pounds of refrigerant for a single unit, about the equivalent of the refrigerant found in 100 household refrigerators. The emission reduction percentage was estimated based on varying leak emission rates, as shown in Appendix A and in Table 6.

Table 6 shows emission reductions that ARB predicts for state regulations that implement AB 32 along with the scaled reductions that will apply to sources in the City of Hesperia.

Table 6: 2020 Community Greenhouse Gas Emission Reductions from State Regulations and AB 32 Measures

End Use Sector	California Regulations and Measures	Reduction from 2020 BAU Inventory (%)	Percentage of 2020 Hesperia Inventory (%)	Scaled Emission Reduction Credit (%)
Transportation: Automobiles, light duty trucks, medium duty trucks	AB 1493 Pavley	19.7	26.1	5.1
	Passenger Vehicle Efficiency	2.8	26.1	0.7
	Low carbon fuel standard	7.2	26.1	1.9
Transportation: Heavy duty trucks	Low carbon fuel standard	7.2	26.2	1.9
	Heavy Duty Efficiency	2.9	26.2	0.8
Transportation: Other	Low carbon fuel standard	7.2	1.0	0.1
Natural gas	Energy Efficiency Measures	9.4	9.2	0.9
Refrigerants	Refrigerant Management	53.1	6.3	3.3
Electricity	Renewable Portfolio Standard	17.0	24.4	4.1
	Solar Roofs	1.5	24.4	0.4
	Energy Efficiency Measures	15.7	24.4	3.8
Solid Waste	Waste - Landfill Methane	14.2	5.1	0.7
Total Reductions from Statewide Measures				**23.7**

Notes:
AB = Assembly Bill; BAU = business as usual; Scaled Emission Reduction Credit = Reduction for 2020 Inventory percentage multiplied by the End Use Sector percentage.
Source for percentage of 2020 Hesperia Inventory: Figure 6.
Sources of California Regulations and Measures: Bay Area Air Quality Management District, 2009 and ARB Scoping Plan, 2008.

SECTION 4: CLIMATE ACTION STRATEGIES

The CAP strategy will be implemented through policies, regulations, programs, and cooperation with other agencies. This section is divided into climate action strategy categories with more detailed strategies under each category. The positive or negative impact of General Plan Update policies on the strategy is assessed. The General Plan Update policies are identified. Note that the following abbreviations are used for elements in the General Plan Update:

- LU – Land Use Element
- OS – Open Space Element
- CI – Circulation Element
- CN – Conservation Element

Finally, information regarding potential emission reductions is provided for each strategy. Many emission reduction estimates are from the California Air Pollution Control Officers Association (CAPCOA) document, CEQA and Climate Change, Appendix B. The CAPCOA document includes a table that compiles emission reductions for each measure and identifies the source of the estimate. The measures are identified as MM D-1, D-2, T-1, and so on, to reference the source of the estimate.

Implementing the strategies is expected to provide emission reductions that are adequate to meet the City's reduction target. The following information provides an analysis that demonstrates that the reductions are feasible. The analysis is not intended to provide definitive project level emission assessments, but to provide assurance that when the City implements its General Plan Update policies and CAP strategies, the targets will be achieved. The CAP provides a mechanism to track progress in implementing the CAP that will help to identify problems early and to provide corrective actions needed to keep on target.

4.1 - Climate Action Strategies

As described in Section 3.2 - Hesperia Inventory, the City's emission inventory is dominated by motor vehicle emissions. The City has control over the emissions from its government fleet vehicles through its purchasing decisions, but no control over the emissions from other vehicles that operate and pass through the City. However, the City's authority over land use provides opportunities to influence the amount people drive and their choice of travel mode. Thus, many of the following strategies attempt to encourage people to drive less and use alternative transportation.

CEQA Compliance

Strategy CAP-1 Reduce emissions from new development through the California Environmental Quality Act process.

CEQA projects that are consistent with this CAP could result in a less than significant impact regarding climate change. This is because the emissions from these projects are generally accounted for in this CAP and would be consistent with this CAP reduction target. To be consistent with this CAP, CEQA projects must implement the applicable CAP implementation strategies listed in Section 4.2.

This is supported by Section 15183.5(a) in the CEQA Guidelines, Tiering and Streamlining the Analysis of Greenhouse Gas Emissions, which states the following:

> Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce greenhouse gas emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review. Project-specific environmental documents may rely on an EIR containing a programmatic analysis of greenhouse gas emissions as provided in section 15152 (tiering), 15167 (staged EIRs) 15168 (program EIRs), 15175-15179.5 (Master EIRs), 15182 (EIRs Prepared for Specific Plans), and 15183 (EIRs Prepared for General Plans, Community Plans, or Zoning).

Mixed Use Development

Strategy CAP-2 Encourage mixed use development in new development and redevelopment areas.

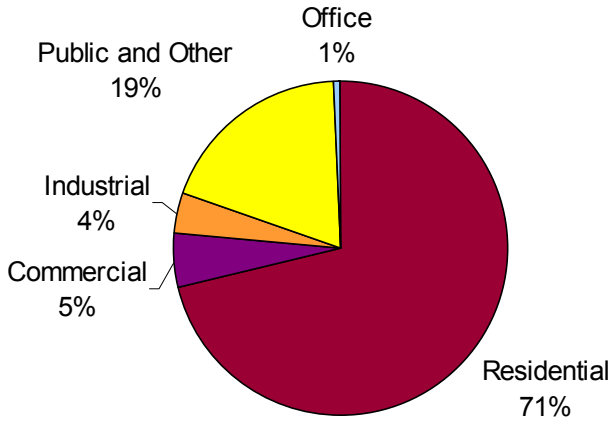
Mixed-use development combines housing, commercial, retail, civic and office uses, placing these key community elements and destinations close to one another, that is, within a short walk, bike ride, or transit stop. Benefits of mixed-use development include increased pedestrian activity and social interaction by bringing key destinations closer together (New Hampshire Department of Environmental Services 2008).

Existing and Future Conditions

In the proposed General Plan Update land use map, the large residential areas are far (as many as 4 miles) from the commercial areas. This is primarily a result of the very low residential density within the City. Generally, the closer jobs and retail are to residential development, the fewer vehicle miles traveled and resulting greenhouse gas emissions. As

shown in Figure 8, the majority of the acreage (71 percent) in the City of Hesperia is dedicated to residential.

Figure 8: Acreage in Hesperia



The Main Street and Freeway Corridor Specific Plan has 33.4 acres of mixed-use development planned as well as 293 acres of Regional Commercial, which permits high-density multi-family residential to create an active, vibrant, mixed-use precinct. The Main Street and Freeway Corridor Specific Plan's Commercial Industrial Business Park zone was adopted in 2008 and is intended to create employment generating uses in a business park setting. This zone is located along the interstate freeway as well as within the industrial area. Similar to the C-3 zone, this zone includes a broad range of uses located near the city's commercial corridors.

The Rancho Las Flores Specific Plan also has a Town Center designation, which allows mixed-use development. This Specific Plan is currently adding sustainability features such as village centers with higher densities, more active recreation areas, trails and reversing the project phasing to start at the northern portion of the project adjacent to existing infrastructure.

Therefore, mixed use currently allocated in the City is 326.4 acres out of 70,039 total acres, or 0.47 percent.

City Ordinances

City ordinance, 10.24.030 requirements—travel demand management, essentially requires the City to advertise transit services, require bus turnouts in some new development, establish a long-range plan for a bicycle trail system, allows retail in proximity to industrial land uses, encourages mixed-use development, and requires that the City evaluate traffic signal timing. There is also a section in the ordinance that requires an update because it is regarding cooperation with the Mojave Desert Air Quality Management District's Rule 1701,

which has since been rescinded. The current ordinance language dealing with mixed-use development is as follows:

B. Measures Presently Implemented by the City.
   3. Promotion of Land Use Regulations.
      a. Amend Zoning Regulations. The city has adopted Ordinance 126 which established a service commercial (C-3) zone district. This district broadens the number and types of retail and service uses that are allowed in areas with proximity to the industrial area with a high concentration of daytime employees. This zoning amendment benefits the reduction of VT and VMT by providing convenient access to vital consumer services and products to industrial employees.
      b. Encourage Mixed-use Development. The city encourages the implementation of master-planned mixed-use developments as evidenced by the approval of the ten thousand (10,000) acre Rancho Las Flores planned development and by the planned mix-use general plan designation of over two thousand (2,000) acres of land contained within the city's current corporate boundaries. These mixed-use developments facilitate optimum VT and VMT ratios by such measures as residential density clustering, planned proximity to work places and commerce and by encouraging efficient roadway infrastructure as well as alternative transit infrastructure.

General Plan Policies that Encourage Mixed-Use Development

LU-2.3 Implementation Policy: Provide opportunities for a variety of residential densities to accommodate rural and suburban lifestyles, and housing types for all economic and demographic segments of the City's population, with convenient access to public facilities, employment and shopping.

LU-2.4 Implementation Policy: Utilize mixed-use development to create unique and varied housing.

LU-3.1 Implementation Policy: Encourage a diverse mix of commercial and service businesses that support the local tax base, are beneficial to residents, and support the economic need of the community.

LU-3.2 Implementation Policy: Sufficient lands should be designated to provide a full range of commercial services to the community and surrounding areas to serve the residential properties at build-out.

Emission Reduction Potential: Mixed-use development can provide reductions ranging from 3 to 9 percent, depending on the mix of uses within the project and the associated pedestrian environment. Mixed-use development that is also infill can reduce emissions by 3 to 30 percent (CAPCOA MM D-9, D-10, and D-12). However, considering that the current

land use plans only have 0.47 percent allocated for mixed use and the City currently has very low residential density, it is anticipated that the reduction potential for this City is also low at 0.2 percent.

Transit-Oriented Development

Strategy CAP-3 Increase transit use.

Transit-oriented development refers to residential and commercial centers designed to maximize access by transit and nonmotorized transportation, and with other features to encourage transit ridership. Typical transit oriented development has a rail or bus station at its center, surrounded by relatively high-density development, with progressively lower density spreading outwards one-quarter to one-half mile, which represents pedestrian scale distances (Victoria Transport Policy Institute 2010).

Transit facilities include items such as bus stops, lighting, bus turnouts, multimodal transfer centers, and information kiosks. These facilities increase the convenience of using transit and minimize impacts on traffic flow from buses re-entering the roadway.

Existing Transit

The City is a member of the Victor Valley Transit Authority (VVTA), along with the cities of Adelanto, Victorville, the Town of Apple Valley, and the County of San Bernardino. The VVTA provides multiple occupancy vehicle service to the City with the intent to reduce traffic congestion, vehicle miles traveled, and vehicle trips. The City provides VVTA with input and information that can help them to provide service in the areas that best meet the needs of the local community.

The VVTA provides para-transit services for persons with special needs on any paved street within the City, as long as it is within their service boundaries. The VVTA para-transit services do not travel a fixed route. Certified passengers are required to schedule rides at least one day in advance.

The VVTA provides the local bus service for the City and adjacent communities of Adelanto, Apple Valley, Victorville, and San Bernardino County. The VVTA operates five bus routes in Hesperia, providing bus connections between shopping centers, public facilities, Victor Valley Mall, hospitals, schools, colleges, and residential areas.

As the population commuting through the Cajon Pass continues to grow, the need for parking facilities to incentivize shared vehicle ridership becomes increasingly important.

There is a park-and-ride facility located at the Joshua Street exit off of I-15. This facility serves commuters travelling down the Cajon Pass to rideshare and carpool with other commuters. This reduces the number of single-occupied vehicles and the overall traffic volume on the road.

The Amtrak Southwest Chief passenger train regularly passes through Hesperia on the Burlington Northern Santa Fe main railroad line. The train route travels from Los Angeles to Chicago, Illinois. There is no Amtrak stop in the City, and the nearest Amtrak station located in the City of Victorville.

Existing Ordinances

10.24.030 – Travel Demand Management

B. Measures Presently Implemented by the City.
   1. Transit/Multiple Occupancy Vehicle Service.
      a. The city is a member of the Victor Valley Transit Services Authority ("VVTSA") which provides multiple occupancy vehicle service to the city. Approximately nine hundred fifteen (915) miles of roads are serviced by the current route, with monthly ridership in excess of twenty thousand (20,000). The availability of this service reduces traffic congestion, vehicle miles traveled and vehicle trips. The fixed-route network will be periodically evaluated to determine appropriate revisions and expansion based upon new development and levels of ridership. The city, with the VVTSA, has promoted the use of this service through various public information measures. These include:
         i. Television commercials on local television and radio stations;
         ii. Appearance by the transit manager on local television and radio talk shows, and at community group meetings;
         iii. Availability of bus schedules at various city locations, including City Hall and other places of public assembly; and
         iv. Notification of city residents of the service through the city newsletter and quarterly recreation and park district newsletter.

      The city will continue to encourage public information programs which promote the use of alternate modes of transportation.
      b. Bus/Multiple Occupancy Vehicle Turnouts. Bus turnouts are required to be designed and installed as a condition of approval for new developments which are likely to generate significant quantities of arriving/departing traffic. These turnouts are provided to accommodate existing bus service routes and to encourage the expansion of service to new developments.

General Plan Policies that Encourage Transit Use

CI -5.1 Implementation Policy: Provide a wide range of travel alternatives to the use of single occupancy vehicles.

CI -5.2 Implementation Policy: Work with Caltrans and San Bernardino Associated Governments (SANBAG) to provide additional park-and-ride lots at key locations near existing and proposed interchanges with Interstate 15.

CI -5.3 Implementation Policy: Continue to participate with the Victor Valley Transit Authority to ensure there are adequate routes to provide efficient, adequate, safe service for the community.

CI -5.4 Implementation Policy: Continue to work with and support the Victor Valley Transit Authority in providing transit facilities for elderly and handicapped residents.

Emission Reduction Potential: Transit oriented development can reduce emissions by 1 to 40 percent. Factors influencing the effectiveness include the type of transit serving the site, the frequency of service, the development density of the site, and the pedestrian connections and environment (CAPCOA MM D-2). Transit support facilities can reduce emissions by 1 to 2 percent by increasing walking and bicycling (CAPCOA MM T-7). The CAP strategies will reduce emissions slightly, by approximately 0.2 percent.

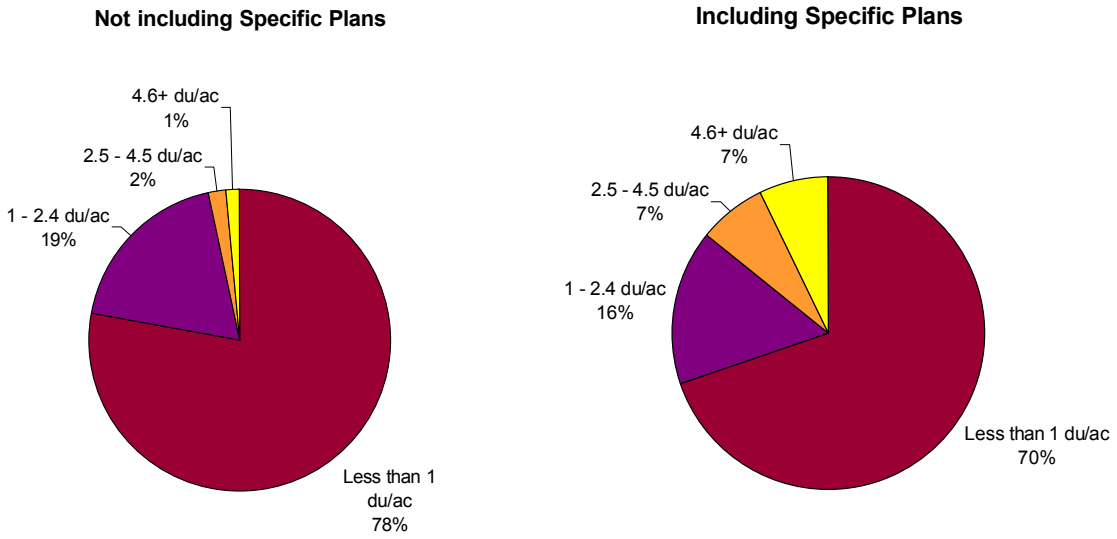
Compact Development

Strategy CAP-4 Promote compact development by protecting open space and encouraging infill and redevelopment of underutilized parcels in urbanized areas.

Compact development is a general term for growth patterns that increase density, are contiguous to existing development, and are efficiently served by public infrastructure. Policies that promote infill, redevelopment, mixed use, and higher overall densities promote compact development. Policies that discourage development on hillsides, natural open space areas, and farmland also encourage more compact development.

The average residential density is 1.6 dwelling units per acre (du/ac) in the City (not including the sphere of influence but including the specific plan areas). As shown in Figure 9, when accounting for specific plans, approximately 70 percent of the total acreage in the City dedicated to residential density are less than 1 du/ac, on average. Less than 7 percent of the acreage is greater than 4.6 du/ac. Not accounting for specific plans, the density is even lower, at 78 percent with less than 1 du/ac and 1 percent greater than 4.6 du/acre. The density in the City is extremely low compared with other cities in California. Clustering and providing more open space could reduce vehicle miles traveled.

Figure 9: Residential Acreage Comparison in Hesperia


Not including Specific Plans
4.6+ du/ac 1%
2.5 - 4.5 du/ac 2%
1 - 2.4 du/ac 19%
Less than 1 du/ac 78%
Including Specific Plans
4.6+ du/ac 7%
2.5 - 4.5 du/ac 7%
1 - 2.4 du/ac 16%
Less than 1 du/ac 70%

General Plan Policies

OS-2.1 Implementation Policy: Select areas for open space preservation based upon criteria such as natural features, sensitive areas, connectivity, and development patterns.

OS-2.2 Implementation Policy: Coordinate efforts with other public and private agencies regarding potential trail systems, recreational facilities and recreational programs.

OS-2.4 Implementation Policy: Identify and assess lands in the City that are suitable for preservation for the purposes of passive or active recreation.

OS-4.1 Implementation Policy: Create linkages between open space areas to accommodate species migration and provide for connected recreational amenities.

OS-4.2 Implementation Policy: Preserve the aesthetic integrity and usefulness of open space washes by implementing restrictive development standards on projects occurring in or around the wash areas, and ensuring development proposals are compatible.

OS-6.2 Implementation Policy: Continue to maintain and provide access to open space areas and recreational facilities.

OS-6.3 Implementation Policy: Provide a comprehensive network trails plan that connects residents to open space areas, recreational facilities, and areas of interest.

OS-6.4 Implementation Policy: Connect open space areas along the eastern side of Interstate 15.

LU-6.6 Implementation Policy: Encourage in-fill development on lands located adjacent to existing developed areas and utilities to maximize the efficiency of land use and infrastructure.

LU-2.8 Implementation Policy: Encourage lot consolidation of multi-family residential properties through creation of a lot consolidation incentive program.

LU-8.3 Implementation Policy: Permit density transfers and clustering as a means of achieving more efficient housing construction and providing areas of usable common open space, in addition to payment of development impact fees.

CN-4.1 Implementation Policy: Preserve pristine open space areas and known wildlife corridors areas for conservation to protect sensitive species and their habitats.

CN-4.2 Implementation Policy: Encourage the protection, preservation and long-term viability of environmentally sensitive habitats and species in the City.

CN-4.3 Implementation Policy: Identify lands that are suitable for preservation for sensitive species and their habitats.

CN-4.4 Implementation Policy: In those areas known as possible habitat for endangered and sensitive species, require proper assessments before authorizing development.

Emission Reduction Potential: Compact development provides emission reductions by reducing travel distances and promoting higher density development that generates fewer vehicle trips. Increasing density can result in emission reductions of 1 to 12 percent (CAPCOA MM D4). Actual reductions in vehicle miles traveled from implementing compact development depend on density, diversity, design, destination accessibility, and distance to transit, and can be anywhere from 20 to 40 percent (Ewing et al. 2007).

Pedestrian Connections

Strategy CAP-5	**Provide pedestrian connections in new and existing development to improve pedestrian mobility and accessibility.**

Pedestrian connections can be improved through the construction of sidewalks and pedestrian paths connecting frequently accessed destinations such as schools and shopping areas with housing and restaurant and commercial services with office developments. Another example is the removal of barriers to walking, such as the construction of pedestrian bridges over busy streets. Enhancing the pedestrian experience by providing adequate width for side-by-side walking, shade, and visual interest should be a part of all pedestrian projects.

Encouraging people to walk rather than drive to local destinations requires the integration of safe, human-scale pedestrian access throughout sites. In subdivisions, pedestrian opportunities may be provided in the form of sidewalks throughout a development or walkways linking new development with existing destinations. Within commercial developments, pedestrians should be separated from vehicular traffic through the use of walkways and landscaped buffers that promote a sense of safety and visual appeal that encourage people to walk. Pedestrian circulation should consider not only movement within a site or development, but also access to adjoining development. Increased use of pedestrian walkways between adjoining developments improves traffic safety by allowing people to walk instead of driving to nearby land uses, thereby reducing the number of vehicles turning into and out of streets and commercial driveways along public roads (NHDES 2008).

Pedestrians in Palm Springs

General Plan Policies

OS-6.1 Implementation Policy: Provide an interconnecting plan in conjunction with surrounding agencies to provide regional trails.

OS-6.2 Implementation Policy: Continue to maintain and provide access to open space areas and recreational facilities.

OS-6.3 Implementation Policy: Provide a comprehensive network trails plan that connects residents to open space areas, recreational facilities, and areas of interest.

OS-6.4 Implementation Policy: Connect open space areas along the eastern side of Interstate 15.

LU-3.4 Implementation Policy: Encourage the beautification of pedestrian areas, particularly through the use of landscaping.

Schools

Thirty years ago, 60 percent of children living within a 2-mile radius of a school walked or bicycled to school. Today, that number has dropped to less than 15 percent. About 25 percent commute by school bus, and over half are driven to/from school in vehicles. Thirty years ago, 5 percent of children between the ages of 6 and 11 were considered to be overweight or obese and today, that number has climbed to 20 percent (Caltrans 2010).

Safe Routes to School Programs are intended to reverse these trends by funding projects that improve safety and efforts that promote walking and bicycling within a collaborative community framework. It is through local champions working with a coalition of parents, schools, and professionals in transportation, engineering, health, and law enforcement that the most sustainable projects are expected to emerge.

The Hesperia Unified School District has an extensive bus program. However, by improving pedestrian access near schools, more children can walk to school.

City Ordinances

16.20.570 General Provisions and Administration:

E. Landscaping shall be installed and maintained in a manner that allows free ingress or egress from any door, window, fire escape, driveway, parking space, sidewalk or other area required for pedestrian, bicycle, motor vehicle or equestrian travel.

12.08.050 Pedestrian Circulation Standards:

A. Sidewalks shall be required on public streets as determined by the reviewing authority. Sidewalks shall be constructed of concrete, with a minimum width of five feet, exclusive of the curb. Any sidewalk constructed within two and one-half (2 1/2) feet from face of curb shall join to back of curb. Considerations in design are to be given for handicapped persons so that a clear path of travel of at least four feet is provided, in accordance with state handicap requirements.
B. Additional sidewalks on site may be required through the design review process, the sidewalk system shall provide for a safe, continuous pedestrian circulation and access system to all parts of the development. Pedestrian access shall be provided from public streets and parking lots to building entries, and walkways provided on-site shall connect with those off-site.
C. The following standards shall apply to meandering sidewalks:
    1. Radii for curved sidewalk shall be between two hundred (200) and six hundred (600) feet.
    2. Maximum sidewalk grade shall conform to state standards for handicapped access.
D. Curb cuts and inclines for handicapped access shall be required in accordance with state law.
E. Bus turnouts and bus shelters may be required during the design review process. These facilities shall be designed to maximize security features and shall be located in proximity to both traffic signals and pedestrian crosswalks, so as to provide for ease of access to both buses and pedestrians, including handicapped persons. Bus stops shall be a minimum of fifty (50) feet in length.

Emission Reduction Potential: Pedestrian oriented development can reduce emissions by 0.4 to 1.0 percent. Factors influencing walking for making trips include completeness of sidewalks and pedestrian paths, the safety of the walking route from passing traffic, and providing visual interest along the route. Distance to potential walking destinations is the most important factor. Most people will not choose to walk distances greater than one-half mile (CAPCOA MM D-2). Areas with good pedestrian connection and access can reduce emissions by 1 to 10 percent by increasing walking and bicycling (CAPCOA MM T-5).

Bicycle Infrastructure

Strategy CAP-6 Increase bicycle use through a safe and well-connected system of bicycle paths and end of trip facilities.

Bicycle facilities that provide clearly marked lanes on roadways or separate bike paths and trails can increase the safety of cyclists and encourage increased use of this mode of travel. Incomplete bicycle networks, narrow choke points on roadways, and freeway interchanges create barriers to cycling. Cyclists have a wide range of abilities and travel at different speeds. Some prefer off-road paths and trails completely separated from traffic and may travel at relatively slow speeds. On-road bike lanes often provide the fastest, most direct route and experience fewer conflicts with pedestrians and family riders.

End-of-trip facilities include items such as showers and lockers for people who bicycle to work, secure bike parking, onsite services (dry cleaning, cafeterias) to reduce trips for errands and lunch. These facilities help to increase the effectiveness of transportation demand management programs.

Non Motorized Transportation Plan

The City has established three types of bike path trails based upon the Hesperia population and needs. These bike paths have been officially established in the Non Motorized Transportation Plan (in the General Plan Update, Open Space Element).

- Class One bike paths are dedicated bike paths outside the street vehicular right-of-way.
- Class Two bike paths are dedicated painted bike lanes in the vehicular right of way on the street.
- Class Three bike paths are designated for vehicles to share the road with bikes.

According to the current Hesperia Bike Paths map (2009), only some of the bike paths are actually constructed. The Main Street and Freeway Corridor Specific Plan as well as the Non Motorized Transportation Plan have freeway crossings planned at Main Street and Ranchero Road. The City will adopt the Non Motorized Transportation Plan as part of the Circulation Element and report progress on construction of facilities as part of its annual report to the Office of Planning and Research on the status of the General Plan.

City Ordinances

16.16.480 Specific land use standards:

C. Convenience Stores. The retail sale of groceries, staples, sundry items and/or alcoholic beverages where the gross floor area is less than five thousand (5,000) square feet is subject to site plan review, and shall be constructed and operated in the following manner:
   4. A bicycle rack shall be installed in a convenient location visible from the inside of the store

16.20.095 Commercial, office and institutional parking standards:

B. Bicycles. All commercial and office areas shall provide adequate locking facilities for bicycle parking at any location convenient to the facility for which they are designated. Whenever possible, weatherproofing or facility covering should be used.

10.24.030 Travel Demand Management

B. Measures Presently Implemented by the City.
   2. Bicycle Program. The city adopted Ordinance 130 establishing a city-wide bicycle trail system and associated design standards. The purpose of the system is to establish a long range plan for the city that will encourage the development and use of bicycles for commuter-oriented transportation. The city is an active participant in the Bicycle Plan Advisory Committee, a standing committee of SANBAG, that is pursuing the establishment of a regional bicycle transportation network.

Emission Reduction Potential: Cities with the best bicycling conditions have achieved bicycle mode shares of 10 to 25 percent. More typically, cities achieve mode shares of 1 to 2 percent. End of trip facilities can reduce emissions by 1 to 5 percent (CAPCOA MM T-2 and T-3).

Traffic Calming

Strategy CAP-7 Use traffic calming measures to improve traffic flow, pedestrian orientation, and bicycle use.

Traffic calming refers to various design features and strategies intended to reduce vehicle traffic speeds and volumes on a particular roadway. Traffic calming policies and/or projects can range from educational efforts such as increased signage to minor modifications of an individual street to a more comprehensive redesign of a road network. Traffic calming changes streetscape design to give greater emphasis to pedestrians, cyclists, and residents.

Infrastructure projects often involve reallocating road space to increase the portion of right-of-way devoted to bicycle lanes, sidewalks and greenspace. Some features, such as wider sidewalks and improved crosswalks, support universal design objectives (making transportation systems accommodate people with disabilities and other special needs). Street reclaiming emphasizes action by neighborhood residents to change the way their streets are perceived and used to better accommodate nonmotorized activities (Victoria Transport Policy Institute 2010).

Traffic circles are an example of a calming measure. They are raised islands at intersections of residential streets. Motorists must reduce speed to maneuver around the circle, which helps reduce accidents. The City of Seattle has an operating Arterial Traffic Calming Program, which reduces traffic on neighborhood streets (Seattle Department of Transportation 2010). This program could be feasible for some streets in Hesperia.

Traffic calming can result in lower air pollutant emissions, when measures smooth traffic flow or reduce queuing and associated engine idling and accelerations. Traffic calming measures that enhance safety for pedestrians and bicyclists can encourage greater use of these modes for more trips and can reduce motor vehicle emissions.

There are no existing measures, General Plan Update policies, or ordinances that address traffic calming.

Emission Reduction Potential: Traffic calming can reduce emissions by 1 to 10 percent by increasing walking and bicycling (CAPCOA MM T-8).

Parking Measures

Strategy CAP-8 Use parking facility designs and parking management to reduce vehicle trips.

The supply and cost of parking can significantly change people's choice of travel mode. The design of parking facilities can have substantial impact on pedestrian orientation and compact development. Relatively small parking fees can cause significant travel impacts and provide significant reductions in vehicle travel (Victoria Transport Policy Institute 2010). Use of parking structures consumes less land for parking and makes walking distances shorter, thus encouraging walking between uses. Surface parking lots placed behind buildings or in shared civic parking facilities create a more pedestrian-oriented streetscape.

Existing City Measures

There is currently one park-and-ride facility with 150 spaces located at 11993 Joshua Street in Hesperia near I-15. Because of the high amount of residential and relatively low amount of jobs in the City, it can be assumed that a large percentage of the population commutes to work. Therefore, more park-and-ride facilities could encourage workers to commute and/or use transit.

City Ordinances

16.20.095 Commercial, office and institutional parking standards

C. Transportation Plans. Facilities may decrease their required number of parking spaces, subject to the adoption by the reviewing authority of an approved transportation management plan supplied by the applicant which may include, but is not limited to, provisions for mass transit, car pooling, staggered work hours, etc.

Emission Reduction Potential: Parking measures are highly effective at reducing vehicle trips and increasing average vehicle ridership. Parking measures can achieve reductions as high as 30 percent, depending on the availability of other transportation options, the distance to transit, the quality of transit, and the cost of parking (CAPCOA MM T-9).

Energy Efficiency

Strategy CAP-9 Increase the use of energy conservation features and renewable sources of energy.

Improving energy efficiency in new and existing buildings and facilities provides one of the most cost-effective strategies for reducing greenhouse gases, because the energy savings can pay for the cost of the upgrades and retrofits over time.

The California Strategic Energy Plan contains the very ambitious goal of making all new homes zero net energy consuming homes by 2020 and all commercial building zero net energy consuming by 2030. The Plan defines zero net energy buildings as buildings that over the course of a year produce as much power as they consume. This is achieved by making the building as energy efficient as possible and providing onsite or nearby renewable power generation with solar panels or wind generators. The Plan relies on voluntary and mandatory actions to achieve the goal. The State would strengthen Title 24 energy efficiency standards every few years and would include voluntary tiers that exceed the mandatory requirements. The Plan anticipates voluntary participation in constructing buildings that exceed Title 24 by 35 percent over the 2005 standard by 2012, and by 55 percent by 2016. The Plan states that cities and counties can lead by example by embracing energy efficiency in their facilities.

The City enforces Title 24 standards in its role as building official. The City reviews all building plans for compliance and city building Inspectors ensure that buildings are constructed to code.

General Plan Policies

LU-2.7 Implementation Policy: Improve neighborhood housing maintenance and home improvements through code enforcement and financial assistance for home rehabilitation.

LU-6.1 Implementation Policy: Promote the use of green building standards and Leadership in Energy and Environmental Design (LEED) (or other equivalent programs) in both private and public projects.

LU-6.2 Implementation Policy: Promote sustainable building practices that go beyond the requirements of Title 24 of the California Administrative Code, and encourage energy-efficient design elements, consistent with Policy LU-6.1.

LU-6.3 Implementation Policy: Support sustainable building practices that encourage the use of recycled or other building materials that promote environmental quality, economic vitality, and social benefits. Support construction, and operational practices that limit impacts to the environment.

LU-6.4 Implementation Policy: Encourage sustainable development that incorporates green building best practices and involves the reuse of previously developed property and/or vacant sites within a built-up area

LU-6.5 Implementation Policy: Encourage development that incorporates green building practices to conserve natural resources as part of sustainable development practices

CN-7.1 Implementation Policy: Explore the potential for a green building program in the City to educate the development community and promote the conservation of natural resources.

CN-7.2 Implementation Policy: Encourage the use of green building standards and Leadership in Energy and Environmental Design (LEED) or similar programs in both private and public projects.

CN-7.3 Implementation Policy: Provide incentives like technical assistance and low-interest loans for projects that are energy efficient and contain energy conservation measures.

CN-7.4 Implementation Policy: Educate the public about energy conservation techniques.

CN-7.5 Implementation Policy: Coordinate with the local energy provide in developing policies and procedures to reduce energy consumption in existing and future developments.

CN-7.6 Implementation Policy: Encourage residents and businesses to utilize the incentives provided by the local energy providers to retrofit their buildings and businesses for energy efficiency and conservation.

CN-8.4 Implementation Policy: Promote the utilization of alternative energy resources such as wind and solar in new development.

CN 8.6 Implementation Policy: Preserve land resources for the utilization of energy resources, including wind and solar energy resources.

CN 8.7 Implementation Policy: Promote energy conservation through site layout, building design, natural light and efficient mechanical and electrical products in development.

CN 8.9 Implementation Policy: Promote sustainable principles in development that conserves such natural resources as air quality and energy resources.

Emission Reduction Potential: Energy conservation measures reduce emissions proportionately with the percentage improvement in energy efficiency. For example, buildings that are 20 percent more efficient than required by regulation would achieve a 20 percent reduction in emissions from electrical generation.

Alternative energy includes solar photovoltaic generation systems, solar water heating systems, and alternative fuels for transportation. Solar systems generate zero operational emissions. The energy savings from the use of solar is included in the overall percent reduction in energy use from new development. Solar implemented at existing homes and commercial buildings is counted as a state reduction for the Million Solar Roofs program.

Energy efficiency standards in buildings have prescriptive elements that specify standards for individual building components and overall building performance standards. The construction materials, amount of windows, and type of roof and foundation all have an effect on energy consumption. For example, in order to meet the Title 24 standards, a building with just a few windows may not need high technology energy efficient windows to meet the standard, while a building with many windows would need to provide high-efficiency windows to meet the standard. This flexibility allows architects to design buildings of all types that can meet the standards without imposing excessive costs. As Title 24 has become more stringent over the years, technology has advanced to the point that most building designs can still achieve the higher efficiency requirements.

The most recent amendments to Title 24 went into effect in January 2010. They are anticipated to reduce greenhouse gas emissions by 396,520 tons per year statewide. The State revises Title 24 every 3 years to identify changes that can provide additional cost-effective energy efficiency improvements. The California Energy Commission encourages local governments to adopt local ordinances that go beyond Title 24.

Water Conservation and Reuse

Strategy CAP-10 Reduce energy use from the transport and treatment of water.

Water and energy are integrally tied to California's economy. The Climate Action Team Water-Energy Sector Sub Group (2008) estimates that approximately 19 percent of all electricity and 30 percent of non-power plant natural gas (not used to generate electricity) used in California is for the conveyance, treatment, distribution, and end use of water.

Strategies for this sector address issues such as water recycling, water end use conservation and efficiency, reducing the energy required for water systems and using renewable energy in that system where practical. Location, elevation, water source, water use sector, water application, quality and energy source, among other factors, are factors that should be considered when addressing the water-energy interface (Climate Action Team 2008).

Water Conservation Programs

Mojave Water Agency, in partnership with the Alliance for Water Awareness and Conservation, launched a new Water Conservation Program on Friday, February 1, 2008, that provides a variety of financial incentives to participating water agencies, such as the City of Hesperia Water District. Hesperia Water District customers who would like to take an active role in reducing their water consumption can receive cash incentives by installing water conservation products.

Hesperia Water District customers are able to take advantage of three incentive programs that encompass the first phase of the program:

- Up to $3,000 cash for replacing your water thirsty lawn with native and adaptive plants
- Up to $175 in a rebate for purchasing a new, water-saving washing machine
- Up to $165 voucher to defray the cost or a rebate for installing a new high-efficiency toilet

The funds available in conservation incentives, disbursed on a first-come, first-served basis, are offered as a result of the Mojave Water Agency receiving a grant from a Water Bond. However, each of the three incentives carries specific guidelines that customers must meet in order to qualify.

The City of Hesperia offers free water conservation kits that include items designed to cut water usage such as kitchen and bathroom aerators, garden flow nozzle, a low-flow showerhead, and leak detectors for toilets. To further the City's water conservation efforts and help teach students the importance of saving water, the City has a very aggressive water education and awareness program that includes a strong partnership with the Hesperia Unified School District. Teachers are provided with materials to use in the classroom and representatives from the City are often invited to make presentations (City of Hesperia Water District 2009).

The City of Hesperia is working with the Victor Valley Wastewater Reclamation Authority (VVWRA) to develop a 2-million-gallons-per-day subregional reclamation facility in Hesperia. One is also being constructed in Apple Valley. Using the subregional reclamation facilities, VVWRA will wholesale recycled water to its member entities, and the member entities will execute contracts to sell the recycled water to both public and private water customers in the Victor Valley. Proceeds from the sale of recycled water will be used to offset the monthly cost of wastewater treatment. By 2020, the flow of wastewater from the service area is expected to be 25.6 million gallons per day, and by 2025 the flow is expected to be

32 million gallons per day, a significant increase from today's flow of 12.8 million gallons per day.

Ordinances

In 2006, state legislation (AB 1881, Laird, 2006) required the Department of Water Resources to adopt an updated Model Water Efficient Landscape Ordinance. In 2009, the State Department of Water Resources adopted an updated model ordinance, which became effective January 1, 2010.

In 2007, the City adopted landscaping regulations that required use of water-efficient plants and prohibited lawns in commercial, industrial, small lot subdivisions and multi-family uses (recreation areas are permitted). Lawns are also limited to 20 percent of front yard in larger lot subdivisions. The City amended the ordinance to add the State's water budget provisions that became effective in 2010.

Chapter 14.40, Water Conservation Emergency Plan, allows the Board of Directors of the Hesperia Water District to declare a water shortage condition to exist and adopt by resolution, conservation measures. There are three conditions in the ordinance: normal, threatened water supply shortage, and water shortage emergency. Measures for a threatened water supply shortage include restricting irrigation, requiring new development to have exterior landscape plans that require use of drought resistant plants and restrict the use of turf to less than 20 percent of the total landscaped area. Measures for a water shortage emergency basically prohibit exterior water use.

General Plan Policies

- CN-1.1 Implementation Policy: Promote the use of desert vegetation with low water usage and drought tolerant materials in landscaped areas.
- CN-1.2 Implementation Policy: Educate residents on water conservation methods with best practices and tips.
- CN-1.6 Implementation Policy: Encourage the use of low-water consumption fixtures in homes and businesses.
- CN-1.7 Implementation Policy: Require new development to use new technology, features, equipment and other methods to reduce water consumption.
- CN-2.2 Implementation Policy: Encourage the use of reclaimed water for irrigation and other non-potable uses.
- CN-2.4 Implementation Policy: Continue to implement the use of reclaimed water through the City's "purple pipe" ordinances and regulations to further the use of reclaimed and treated water.

Emission Reduction Potential: Water conservation reduces greenhouse gases through savings in energy used to transport water from its source and from water treatment. Water recycling consumes additional energy from treatment; however, treatment is often required to meet water quality regulations and so the energy use in that case would occur anyway. Achieving the State's goal of 20-percent reduction in water consumption by 2020 would result in a 20 percent reduction in greenhouse gas emissions from this sector.

Waste Reduction and Recycling

Strategy CAP-11 Improve the City's recycling and source reduction programs to make continued progress in minimizing waste.

When organic materials, construction materials and other municipal solid wastes are discarded, they end up in landfills. Increasing waste diversion from landfills and recycling materials will significantly reduce greenhouse gas emissions. Furthermore, use of composted organic materials provides additional benefits. Currently, the State is mandated to divert a minimum of 50 percent of its waste from going to landfills. Diverting more organics/biomass and other waste from landfill disposal and turning them into marketable products will reduce greenhouse gas emissions associated with the manufacture of new products and the methane emissions from waste in landfills.

Existing City Measures

On September 6, 2005, the City of Hesperia was instructed by the California Integrated Waste Management Board to implement an emergency Construction and Demolition Ordinance, which would require construction and demolition debris generated within the City to be recycled, because that waste made up 21.6 percent of the City's waste stream. The fine that can be imposed on the City for non-compliance can run as high as $10,000 per day.

The City is currently revising its solid waste ordinance. Construction and demolition waste provisions are included in this revision, scheduled for adoption in 2010.

Hesperia Recycling Market Development Zone

On January 5, 2010, the California Department of Resources and Recycling (formerly known as the California Integrated Waste Management Board) approved Hesperia's application for a 10-year Recycling Market Development Zone. This new designation is funded through tipping fees received by landfills and is a tremendous benefit to the community as well as an economic development tool for recycling manufacturers seeking relocation into the Victor Valley. Recycling Market Development Zones benefit the community in the following ways:

- Stimulate the attraction and expansion of recycled-content product manufacturers into the community;
- Can cause decreases in commodity prices due to the reduction in logistics costs;
- Decrease community dependence on landfills;
- Assist local municipality with meeting state mandated landfill diversion rates, currently at 50 percent;
- Add jobs;
- Increase local revenues; and
- Contribute to the reduction of greenhouse gas emissions.

Businesses seeking to take advantage of benefits must reduce waste currently going to landfills. Benefits include below market terms financing for new development and expansion projects, technical assistance, and free product marketing. A business that may be eligible for benefits would include any of the following:

- Waste prevention manufacturing that reduces the materials used to make products
- Processes that make products reusable again by repair, reconditioning, and/or washing
- Manufacturing that takes solid waste to make recycled material or uses a recycled raw material to make a final product
- Conversion technology and biomass processes that convert waste to energy, fuel, etc., excluding high heat processes

General Plan Policies

CN-7.7 and CN-8.8 Implementation Policy: Continue the existing recycling program and utilization of the material recovery facility program while exploring additional methods of reducing waste.

CN 8.5 Implementation Policy: Promote the utilization of environmentally sensitive construction materials to limit impacts on the ozone, global climate change and mineral resources.

Emission Reduction Potential: Waste reduction and recycling provide emission reductions from lower transport emissions for trips to the landfill, lower methane emissions from the decomposition of organic matter in the landfill, and from energy savings from using recycled materials compared to mining, and processing virgin materials into products.

New development in the City will participate in the residential and commercial recycling programs that are available to all residents and businesses. The City's Construction and Demolition Debris Ordinance requires projects to divert at least 50 percent of waste from construction/ demolition/remodel activities. The City anticipates that its current programs will result in continued improvements in rates of recycling of at least 10 percent by 2020.

Regional Cooperation

Strategy CAP-12 Participate in regional programs and initiatives that reduce greenhouse gas emissions.

Measures and programs that impact greenhouse gas emissions are often operated at the regional level. Many modes of transportation operate at the regional level, because people travel throughout the region. Regional cooperation provides a venue for sharing knowledge and resources to help address a variety of issues, including climate change and greenhouse gas emissions.

General Plan Policies

CN-8.1 Implementation Policy: Coordinate with the Regional Councils of Government in developing appropriate regional climate action policies.

CN 8.2 Implementation Policy: In conjunction with regional councils of government, prepare and implement a city climate action plan.

CN-8.3 Implementation Policy: Coordinate with neighboring cities and public jurisdictions in the preservation of air quality resources.

Emission Reduction Potential: No reductions are taken for regional cooperation. Regional cooperation improves the effectiveness of other measures.

Government Operations

Strategy CAP-13 Reduce greenhouse gas emissions from City government operations.

The City will implement strategies to reduce greenhouse gas emissions for uses directly under the responsibility of the City such as civic buildings, street and traffic lighting, the government vehicle fleet, and employee programs. The City has already implemented various methods to reduce emissions, such as the purchase of bicycles and two hybrid vehicles for employees to use for lunchtime trips. Solar panels are planned to be installed on the new sheriff's station, the County Government Center as well as the new Victor Valley Transit Authority facility. The new sheriff's station and the County Government Center will be LEED certified. The City also constructed a windmill in Civic Plaza Park that supplies power for park lighting. Additional strategies are identified in Section 4.2 below.

Climate Change Adaptation

Strategy CAP-14 Improve the City's adaptation to climate change effects.

See Section 5: Climate Change Adaptation for a full discussion of this strategy.

4.2 - Implementation and Monitoring

This section directs the effective implementation of the CAP by City staff and other stakeholders. State Government Code Section 65400 requires the City to prepare and submit an annual report on the status of the General Plan Update and progress in its implementation to the City Council, the Governor's Office of Planning and Research, and the Department of Housing and Community Development. This suggests that the CAP be designed so that it can be monitored, updated, and its effectiveness measured on an annual basis towards meeting a target for reduction of greenhouse gas emissions through buildout of the General Plan Update.

This section provides matrices detailing the essential action steps, a timetable for implementation, responsible departments, progress indicators, and targets.

Strategy CAP-1 Reduce emissions from new development through the California Environmental Quality Act process.

CAP Implementation Action		Timetable	Responsibility
CAP-1.1	Projects developed within a CAP compliant Development Plan or Specific Plan that meet all applicable design criteria and mitigation measures will be deemed consistent with the CAP.	Ongoing	Planning
CAP-1.2	Projects developed outside a CAP compliant Development Plan or Specific Plan but not requiring a discretionary approval shall comply with all applicable regulations. No consistency determination is required, but the City will keep track of building permit data to take credit for voluntary measures implemented by the projects.	Ongoing	Planning

CAP Implementation Action		Timetable	Responsibility
CAP-1.3	Projects developed outside a CAP compliant Specific Plan area and requiring a discretionary land use approval will be reviewed to ensure all feasible CAP measures for the type of project are implemented.	Ongoing	Planning
CAP-1.4	Projects that amend a CAP compliant Specific Plan will be required to demonstrate that it will implement all cost-effective, technologically feasible measures to reduce greenhouse gases so that the project would not hinder or delay implementation of CAP targets.	Ongoing	Planning
CAP-1.5	Projects that require a discretionary approval shall reduce operational greenhouse gas emissions by at least 12 percent, without accounting for regulations discussed in the CAP. The project inventory should include all potential sources, including but not limited to those identified in this CAP.	Ongoing	Planning
CAP-1.6	New agricultural projects that would generate manure should assess the feasibility of manure digesters and install if feasible.	Ongoing	Planning
Progress Indicator		**Target**	
CAP-A	Development plans received meeting the applicable criteria	100% of those received for City review	

Strategy CAP-2 Encourage mixed use development in new development and redevelopment areas.

CAP Implementation Action		Timetable	Responsibility
CAP-2.1	Review the City's Development Code to identify additional measures that will improve opportunities mixed use development	By June 30, 2012	Planning
CAP-2.2	The City should maintain a list of sites available for mixed use and infill development and make the list available to developers. The City should establish developer incentives to encourage well-designed mixed use and infill development projects in these areas.	By June 30, 2012	Planning

CAP-2.3	The City should encourage ancillary employee services (including but not limited to child care, restaurants, banking facilities, convenience markets) near major employment centers for the purpose of reducing midday vehicle trips.	Ongoing	Planning
CAP-2.4	The City should update its travel demand management ordinance (10.24.030).	January 1, 2015	Planning
Progress Indicator		**Target**	
CAP-C	Development plans received meeting the applicable criteria in areas designated for mixed-use	100% of those received for City review	

Strategy CAP-3 Increase transit use.

CAP Implementation Action		Timetable	Responsibility
CAP-3.1	The City, the San Bernardino Associated Governments, and other stakeholders should discuss the potential for a future rail stop in the City. Appropriate right-of-way and land should be dedicated for this future use if applicable.	During formulation of Sustainable Communities Strategies or Alternative Planning Strategies in conjunction with Southern California Association of Governments and the San Bernardino Associated Governments.	Planning
CAP-3.2	Review the City's Development Code to identify additional measures that will improve transit oriented development and transit use.	By June 30, 2012	Planning
CAP-3.3	The City should provide for increased intensity of development along existing and proposed transit corridors.	Ongoing	Planning
CAP-3.4	The City should coordinate with regional transit providers and use public education to accomplish the following objectives: 1. Encourage City residents and workers to rideshare and use transit. 2. Promote the use of alternative work schedules such as flexible working hours and alternative workweeks (e.g., 4-day). 3. Educate residents of all ages about local mobility choices.	Ongoing	Planning

CAP Implementation Action		Timetable	Responsibility
CAP-3.4 (cont.)	4. Work with schools to improve and advertise nonautomotive options for getting to school and school-related activities. 5. Coordinate education activities and make materials available to residents. Utilize forums, flyers, brochures, and the City's website to accomplish these objectives.		

Strategy CAP-4 Promote compact development by protecting open space and encouraging infill and redevelopment of underutilized parcels in urbanized areas.

CAP Implementation Action		Timetable	Responsibility
CAP-4.1	Follow General Plan Update policies regarding protection of open space and viewsheds when reviewing annexation and development requests.	Ongoing	Planning
CAP-4.2	Allocate or acquire open spaces in accordance with the City of Hesperia General Plan Open Space Element and the Urban Design Framework.	Ongoing	Planning
CAP-4.3	Provide incentives to developers that propose affordable, higher density development such as density bonuses and Floor Area Ratio increases.	Ongoing	Planning
CAP-4.4	Increase accessibility to open space areas by trails, bike lanes, and/or transit.	By January 1, 2030	Planning
Progress Indicator		**Target**	
CAP-D	Development plans received meeting the applicable criteria for open space protection.	100% of those received for City review	

Strategy CAP-5 Provide pedestrian connections in new and existing development to improve pedestrian mobility and accessibility.

CAP Implementation Action		Timetable	Responsibility
CAP-5.1	Follow the City's development ordinances regarding the provision of pedestrian infrastructure.	Ongoing	Planning, Engineering
CAP-5.2	Upgrade pedestrian infrastructure when roadways are reconstructed or expanded and right-of-way is available.	Ongoing	Planning, Engineering
CAP-5.3	Encourage pedestrian oriented designs and features when developers submit site plans	Ongoing	Planning, Engineering
CAP-5.4	The City will apply for Safe Routes to School funding.	January 1, 2012	Engineering
CAP-5.5	The City should work with developers to ensure that safe and attractive sidewalks, walkways, bike lanes, and crosswalks that facilitate use are provided in accordance with City standards. The City should work with developers to construct links to adjacent communities, using open space easements and utility easements when appropriate.	Ongoing	Planning, Engineering
Progress Indicator		**Target**	
CAP-E	Development plans received meeting the applicable design standards. Reconstruction projects include pedestrian infrastructure improvements.	100% of those received for City review	

Strategy CAP-6 Increase bicycle use through a safe and well-connected system of bicycle paths and end of trip facilities

CAP Implementation Action		Timetable	Responsibility
CAP-6.1	The City will work with the County and neighboring jurisdictions to extend the facilities required by the Non-motorized Transportation Plan as private development and Capital Improvement Projects are planned and constructed.	Ongoing	Planning, Engineering
CAP-6.2	Continue to pursue funding for projects that improve connections and safety of the City's bicycle system.	Ongoing	Planning, Engineering

CAP-6.3	The City should implement a Bicycle Spot Improvement Program to provide low cost improvements to enhance bicycle safety and convenience for bicyclists by allowing them to use the existing street system more comfortably. The Program should include a discussion of the following components (see City of Seattle for example): - Surface Improvements - pothole patching, drain grate replacement, etc. - Signing and Striping - motor vehicle warning signs at trail crossings, bicycle lane striping and stenciling, etc. - Access Improvements - adjusting of electronic detection for bicyclists at traffic signals, traffic island modification, etc. - Sidewalk Bike Rack Installation	January 1, 2012	Planning, Engineering
Progress Indicator		**Target**	
CAP-F	Non Motorized Transportation Plan – Sphere of Influence - Construction of Bicycle Paths	Allocate bicycle paths on existing and future roads within the City's Sphere of Influence. Funding for bike paths is from grants, the City's Capital Improvement Program, and private development. Bicycle paths in the Non Motorized Transportation Plan should be constructed: 50% by 2020 100% by 2050	

Strategy CAP-7 Use traffic calming measures to improve traffic flow, pedestrian orientation, and bicycle use.

CAP Implementation Action		Timetable	Responsibility
CAP-7.1	Conduct analysis regarding feasibility of Arterial Traffic Calming Program.	Analysis of Program by January 1, 2014. Implementation by January 1, 2020.	Transportation

Strategy CAP-8 Use parking facility designs and parking management to reduce vehicle trips.

CAP Implementation Action		Timetable	Responsibility
CAP-8.1	Continue to work with Caltrans to design and build additional park and ride facilities to serve commuters on Interstate-15. A minimum of 200 parking spaces should be added to new or existing park-and-ride location(s).	January 1, 2020	Planning
CAP-8.2	Consider alternative parking strategies to encourage carpooling and alternative transportation modes	Ongoing	Planning/Community Development
CAP-8.3	The City should encourage development to provide preferential parking for alternative fuel vehicles and carpools.	Ongoing	Planning

Strategy CAP-9 Increase the use of energy conservation features and renewable sources of energy.

CAP Implementation Action		Timetable	Responsibility
CAP-9.1	Increase the effectiveness of City Building inspection programs to improve compliance with Title 24.	June 30, 2012	Building and Safety
CAP-9.2	Track State initiatives regarding zero net energy consumption and encourage installation of solar or other yet-to-be determined technologies that prove to be cost-effective.	Ongoing	Planning
CAP-9.3	Preserve land resources for the utilization of energy resources, including wind and solar energy resources by providing tax incentives for land that is used for energy resources.	Develop ordinance by January 1, 2012	Planning
CAP-9.4	Provide developer incentives (such as density bonus incentives) for green and/or LEED certified buildings.	Develop incentives by January 1, 2015	Planning
CAP-9.5	Promote and incentivize alternative energy such as wind and solar in new development and revitalization projects.	Develop incentives by January 1, 2015	Planning

CAP-9.6	Establish a marketing and education plan for City residents to encourage green building standards, alternatives to driving, energy conservation through high efficiency lighting and appliances, and alternative energy such as wind and solar.	Develop plan by January 1, 2015	Planning
CAP-9.7	Participate in utility-sponsored (e.g., Southern California Edison) sustainability programs.	Ongoing	Planning
CAP-9.8	The City will continue to implement its Ordinance (DCA-09-10177, effective November 22, 2009) to enable the installation of solar and wind power on residential, commercial, industrial, and institutional uses.	Ongoing	Planning and Building and Safety
Progress Indicator		**Target**	
CAP-G	1) Development plans received meeting the applicable criteria 2) Building Dept. completes review of inspection program. Compile results of Title 24 Compliance Reports to show amount achieved over standards	1) 100% of those received for City review 2) Program upgrade recommendations submitted to City Council	

Strategy CAP-10 Reduce energy use from the transport and treatment of water.

CAP Implementation Action		Timetable	Responsibility
CAP-10.1	Follow General Plan Update policies regarding water conservation and recycled water use.	Ongoing	Planning
CAP-10.2	Achieve the state target of a 20-percent reduction in water consumption by 2020.	Ongoing	Building and Safety
CAP-10.3	Implement the State Model Water Efficient Landscape Ordinance.	January 1, 2011	Planning
Progress Indicator		**Target**	
CAP-H	Water consumption statistics from water providers	20% reduction from new development	

Strategy CAP-11 Improve the City's recycling and source reduction programs to make continued progress in minimizing waste.

CAP Implementation Action		Timetable	Responsibility
CAP-11.1	AB 939 mandated local jurisdictions to meet solid waste diversion goals of 25 percent by 1995 and 50 percent by 2000. In 2006, Hesperia had a 53 percent waste diversion. The City will divert solid waste from landfills even further by diverting a minimum of 60 percent of its waste, an increase of 7 percent.	By January 1, 2020	City Manager's Office
CAP-11.2	Require new commercial, multi-family residential, and industrial development to incorporate storage of recyclables in site designs.	Ongoing	Planning
CAP-11.3	The City should continue to implement solid waste diversion programs as well as public education programs. The City should work with the solid waste services provider within the City to ensure that appropriate recycling containers, procedures, and education are readily available throughout the community.	Ongoing	City Manager's Office
Progress Indicator		**Target**	
CAP-I	1) Development plans received meeting the applicable criteria 2) Status report on achieving landfill recycling and diversion targets	1) 100% of those received for City review 2) Divert at least 60% of waste from landfills.	

Strategy CAP-12 Participate in regional programs and initiatives that reduce greenhouse gas emissions.

CAP Implementation Action		Timetable	Responsibility
CAP-12.1	Follow General Plan Update policies regarding regional cooperation	Ongoing	All Departments
CAP-12.2	Continue to actively participate in regional organizations.	Ongoing	All Departments
CAP-12.3	Assign staff as needed to participate in organization meetings	Ongoing	All Departments
CAP-12.4	The City should work closely with the San Bernardino Associated Governments to achieve the following: 1. Implement the San Bernardino Associated Governments Congestion Management Program within the City. 2. Expand and improve bus service within the City. 3. Encourage express bus service to regional activity centers. 4. Encourage provision of attractive and appropriate transit amenities, including shaded bus stops. 5. Provide special transit services (such as direct shuttle or dial-a-ride services). 6. Coordinate with the County to align the City and County's Non-motorized Transportation Plans. 7. Coordinate with the California Department of Transportation (Caltrans) on all plans, activities, and projects that affect California roadway facilities.	Ongoing	All Departments
Progress Indicator		**Target**	
CAP-J	Participation in organizations identified in the General Plan Update	100% participation in identified regional initiatives with appropriate staff attendance	

Strategy CAP-13 Reduce greenhouse gas emissions from City government operations.

CAP Implementation Action		Timetable	Responsibility
CAP-13.1	The City should purchase hybrids and/or smaller, more fuel efficient fleet vehicles when replacing existing vehicles. The City should replace vehicles with the lowest emission technology that fulfills the work requirements and that is cost-effective, as the current fleet reaches the end of its useful life.	Ongoing	All Departments
CAP-13.2	The City should promote carpooling, and the use of mass transit by municipal employees.	Ongoing	All Departments
CAP-13.3	The City should encourage municipal employees to walk or ride a bicycle to nearby meetings and facilities.	Ongoing	All Departments
CAP-13.4	The City should allow flex time and telecommuting by municipal employees.	Ongoing	All Departments
CAP-13.5	The City should locate context setting and highly symbolic public facilities with regard to multi-modal accessibility.	Ongoing	Planning
CAP-13.6	The City should participate in the National Idle-Reduction Campaign (www.epa.gov/cleanschoolbus/antiidling.htm),	January 1, 2012	Planning
CAP-13.7	City should install solar panels or wind generators on City buildings.	Ongoing	Administration
CAP-13.8	New City buildings over 5,000 square feet should incorporate adequate LEED credits to be certified. The buildings do not necessarily have to become officially "certified."	Ongoing	Planning
CAP-13.9	The City should install high efficiency heating, ventilation and cooling equipment when building new City buildings and replacing obsolete units. The City should install energy management systems in new and remodeled buildings.	Ongoing	Administration
CAP-13.10	The City should replace lighting fixtures with more efficient LED or other technology whenever possible.	Ongoing	Administration

CAP Implementation Action		Timetable	Responsibility
CAP-13.11	The City should purchase equipment certified under the Energy Star program whenever cost-effective versions are available that meet all operational requirements.	Ongoing	Administration
CAP-13.12	The City should purchase materials with high recycled content whenever products are available that meet operational requirements and do not result in additional maintenance or excessive costs.	Ongoing	Administration
CAP-13.13	The City should implement water saving measures at public parks and other landscaped areas maintained by the City. The City should use recycled water in public landscaped areas as supplies become available.	Ongoing	Maintenance
CAP-13.14	The City should install higher efficiency irrigation systems, precision sprinklers, and drip irrigation where the landscaping permits these systems and budget allows.	Ongoing	Maintenance
CAP-13.15	The City should install recycling receptacles next to each waste receptacle provided by the City.	January 1, 2014	Maintenance
CAP-13.16	The City should analyze completed projects to determine if the CAP targets are being achieved and propose revisions or additional programs if needed.	Ongoing	Planning
CAP-13.17	The City should update the CAP, if necessary, to reflect changes in state regulations and CAP programs.	January 1, 2015	Planning
Progress Indicator		**Target**	
CAP-13.K	1) The City should assign a CAP Coordinator 2) The City should assign Department responsibilities for providing specific information under their purview. 3) Compile first progress report as a section/chapter of the Annual General Plan Implementation Report. 4) The City should identify program improvements and new programs that the City can pursue.	Assign responsibilities by January 1, 2011.	

Strategy CAP-14 Improve the City's adaptation to climate change effects.

CAP Implementation Action		Timetable	Responsibility
CAP-14.1	New projects should assess the significance of wildfires, water supply, flooding, and any other potential impacts from climate change in California Environmental Quality Act documents.	Ongoing	Planning and Engineering
CAP-14.2	Developers should provide an assessment of a project's potential impacts on the local and subregional storm drainage systems, so that the City can determine appropriate mitigation to ensure that system capacity and peak flow restrictions are not exceeded.	Ongoing	Planning and Engineering
CAP-14.3	To reduce flood peaks, reduce sedimentation, temporarily store floodwaters, recharge aquifers and restore environmental flows, flood management should be integrated with watershed management on City owned open space, agricultural, wildlife areas, and other low-density lands.	Ongoing	Planning and Engineering
CAP-14.4	Low-impact development techniques should be used in new development to infiltrate and store runoff.	Ongoing	Planning and Engineering
Progress Indicator		**Target**	
CAP-L	Development plans received meeting the applicable criteria	100% of those received for City review	
CAP-M	Require added stormwater management facilities as part of discretionary projects and City public works projects.	Fund development of stormwater management facilities in the City's Capital Improvement Program.	

SECTION 5: CLIMATE CHANGE ADAPTATION

Despite efforts to reduce greenhouse gas emissions, greenhouse gases can remain in the atmosphere for hundreds of years. Therefore, it is probable that climate change impacts will still be observed. The impacts vary dependant upon the region. In California, climate change may result in a decreased water supply, sea level rise, increased wildfires, to name a few. In order to manage these impacts, the City's vulnerability to these impacts is assessed and strategies have been developed to adapt to the projected changes.

Climate change adaptation refers to efforts that respond to the impacts of climate change, such as adjustments in natural or human systems to actual or expected climate changes to minimize harm or take advantage of opportunities.

Determining potential future impacts from climate change is an evolving process. The 2009 California Climate Adaptation Strategy provides a proactive foundation for an ongoing adaptation process within California for the sectors with the greatest risks. The document provides strategies for state and local governments to adapt to climate change. By incorporating applicable strategies as CAP Implementation Strategies, the City is taking a proactive approach to ensure that impacts to the City are minimized.

Strategy CAP-14 Improve the City's adaptation to climate change effects.

The main risks that could be experienced in the City are increased wildfires, reduced water supply, and flooding. General Plan policies that would decrease the risks to the City are shown below. CAP implementation actions that would further reduce risks and protect City residents and resources from potential impacts from climate change are shown in Section 4.2.

5.1 - Wildfires

The risk of both urban and wildland fires exists in Hesperia. The hazards related to wildland fires are related to a combination of factors including winds, temperatures, humidity levels, fuel moisture content of vegetation and topography. The risk to the community is increased in some areas because of the combustibility of building materials including roofs, adequacy of access roads, water supply duration, and pressure and maintenance of flammable vegetation surrounding structures.

Wildfire in Hesperia

New development will likely create increased fire hazards caused by interactions between open area and residential development. Therefore, projected development in the City's Planning Area will likely require the construction of fire suppression services facilities for new subareas. The budgeting and timing of such construction should be considered with respect to safety and the pace of new development. Moreover, community design techniques that allow optimal fire services response time should remain a priority.

Areas near Hesperia specifically known for their high to very high wildland fire susceptibility include the mountainous region of the San Bernardino National Forest to the south. This undeveloped to slightly developed area is characterized by steep topographic gradients, and hot, dry summers and autumns. Fires starting in these highland areas can easily spread into the developed foothills, especially if conditions are windy and dry. Farther in the Mojave River lowlands, including in the Hesperia area proper, wildland fires have historically occurred primarily in the southern and western portions of the City and its Sphere of Influence.

Hesperia is located in the lower Mojave section of the Southeastern Deserts Bioregion. The predominant vegetation assemblages in this area include desert shrub, and creosote bush shrub. Other important vegetation types include Joshua tree woodland, shad-scale scrub, blackbrush scrub, and desert scrub-steppe. About one-third of the desert floor in the Mojave section is devoid of vegetation, limiting the amount of surface fuel loads available to burn. There are variations in the annual precipitation for the Mojave region, and as a result, there is a significant variation in the frequency and extent of wildland fires in the area. Several historical wildland fires have occurred primarily in the southern part of Hesperia and its Sphere of Influence between 1930 and 2008.

As stated in the City of Hesperia General Plan Safety Element, the City is not located within a fire threatened community. In addition, based on a cumulative point system that weighs a community's fire-suppression delivery system, including fire dispatch, fire department representation (in the form of equipment, personnel, training, distribution of fire stations), and water supply adequacy and condition, the Insurance Services Office ranks a community's fire protection needs and services. Rating varies from Class 1 (best) to Class 10 (worst). Hesperia currently has a Class 5 Insurance Services Office (ISO) rating in the developed portions of the City and a rating of Class 9 in the outlying areas. The very high hazard areas are in open space designations and no construction is expected within those areas.

Dozens of small vegetation fires, typically less than 1 acre in area, are reported in the Hesperia area annually. Experience and research have shown that vegetation management or fuel modification is an effective means of reducing the wildland fire hazard. Therefore, property owners are encouraged to follow maintenance guidelines aimed at reducing the amount and continuity of vegetation fuel available. If uncontrolled or high weeds, plant

material, and other prohibited items are present on a property, the Fire Marshall has authority to give the property owner of record a notice to abate the hazard. If the owner does not comply within 30 days of receiving the order, the City has authority to abate the hazard and charge the property owner for the cost. Vegetation treatments include the thinning or removal of vegetation within a given distance from habitable structures to create a defensible space. A fuel modification zone is a ribbon of land surrounding a development that is designed to diminish the intensity of a wildfire as it approaches the structures. Fuel modification treatments are being developed for the Rancho Las Flores area in Hesperia.

Building construction standards can also help reduce the fire hazard. Fire-resistant and non-combustible roofing materials, finely screened attic ventilation openings, non-combustible exterior siding materials, multiple-pane windows, and tempered glass windows all can help a structure perform better in the event of a fire. Every proposed construction project in Hesperia is reviewed by is reviewed by the Hesperia Building and Safety Division and the San Bernardino County Fire District for compliance with the most recent version of the California Building and Fire codes, adopted by the City including City amendments to the Code.

California State law requires that the fact a property is located in a fire hazard area be disclosed in real estate transactions. This is important because the relatively rapid turnover of residential ownership can create an information gap; as a result, uninformed homeowners in fire hazard areas may attempt landscaping or structural modifications to their houses that could be a detriment to the fire-resistant qualities of the original structure, with potentially negative consequences.

Wildfire occurrence in California was modeled under a range of future climate and development scenarios. Substantial increases in wildfire are anticipated for most scenarios, although the range of outcomes is large and increases with time. The increase in wildfire area burned associated with the higher emissions pathway (Special Report on Emissions Scenario A2) is substantial, with increases statewide ranging from 57 percent to 169 percent by 2085, and increases exceeding 100 percent in most of the forest areas of Northern California by 2085 (Westerling et al. 2009).

Maps were created utilizing this modeling data by CalAdapt (2010). The area in which the City is located is associated with a “moderate” fire threat and a “very high” fire threat to people. Review of the maps indicates that because of climate change, the danger of wildfires is between 0.4 and 1.6 times more than in the historical period.

According to the California Department of Forestry and Fire Protection (2010), in California in 2009, 8291 fires burned 93,296 acres. In 2008, 5744 fires burned 390,615 acres.

The following General Plan policies would reduce wildfire risks to the City.

General Plan Policies

SF-3.1 Implementation Policy: The City shall continue to require that all new habitable structures be designed in accordance with the most recent California Building and Fire Codes with local amendments adopted by the City.

SF-3.2 Implementation Policy: The City will continue to conduct regular inspections of parcels throughout the city, and will direct property owners to bring their property into compliance with fire inspection standards. This includes enforcing the weed abatement and notification program, to reduce the potential for vegetation fires to occur in vacant or poorly maintained lots, and encouraging homeowners to follow fire-safe practices, including maintaining a fire-safe landscape, and keeping combustibles (such as fire wood) a safe distance away from all structures.

SF-3.3 Implementation Policy: Select City staff will coordinate with the San Bernardino County Fire Department and train in NIMS-compliant emergency response procedures to provide assistance as needed during emergency situations. This includes conducting emergency response exercises, including mock earthquake-induced fire-scenario exercises, to evaluate and improve, as needed, the City's ability to respond to the multiple ignitions that an earthquake is likely to generate.

SF-3.4 Implementation Policy: In conformance with Assembly Bill 2140 (2006) the City will adopt its Hazard Mitigation Plan (HMP) as an addendum to the Safety Element of the General Plan. In addition, the HMP needs to be updated every 5 years, per the requirements of the Federal Disaster Mitigation Act of 2000.

SF-3.5 Implementation Policy: The City, in cooperation with the San Bernardino County Fire Department, will evaluate citizen notification systems that can be used to warn residents of an approaching wildfire and to provide evacuation instructions.

SF-3.6 Implementation Policy: The City will encourage owners of non-sprinklered high-occupancy structures to retrofit their buildings to include automatic fire sprinklers.

SF-3.7 Implementation Policy: The City, in cooperation with the San Bernardino County Fire Department, will ensure, to the maximum extent possible, that fire services, such as fire fighting equipment and personnel, infrastructure, and response times, are adequate for all sections of the City. The City shall continue to utilize the San Bernardino County Fire Department "Community Safety Division Standards" and the latest adopted edition of the California Building and Fire Codes.

SF-3.8 Implementation Policy: The City, in cooperation with the San Bernardino County Fire Department, will ensure that the Hesperia Water District conducts

annual fire flow tests and addresses any deficiencies found as soon as possible.

SF-3.9 Implementation Policy: The City, in cooperation with the San Bernardino County Fire Department, will develop and hold regular training exercises that involve residents as much as possible, such as through the City's Community Emergency Response Team (CERT) program, to empower individuals and neighborhoods to be self-reliant in the aftermath of a natural or man-made disaster.

SF-3.10 Implementation Policy: The City will adopt the most recent version of the Wildland –Urban Interface Code and Chapter 7A of the California Building Code for use in the City where the Insurance Services Offices (ISO) number exceeds 5 (greater than 5).

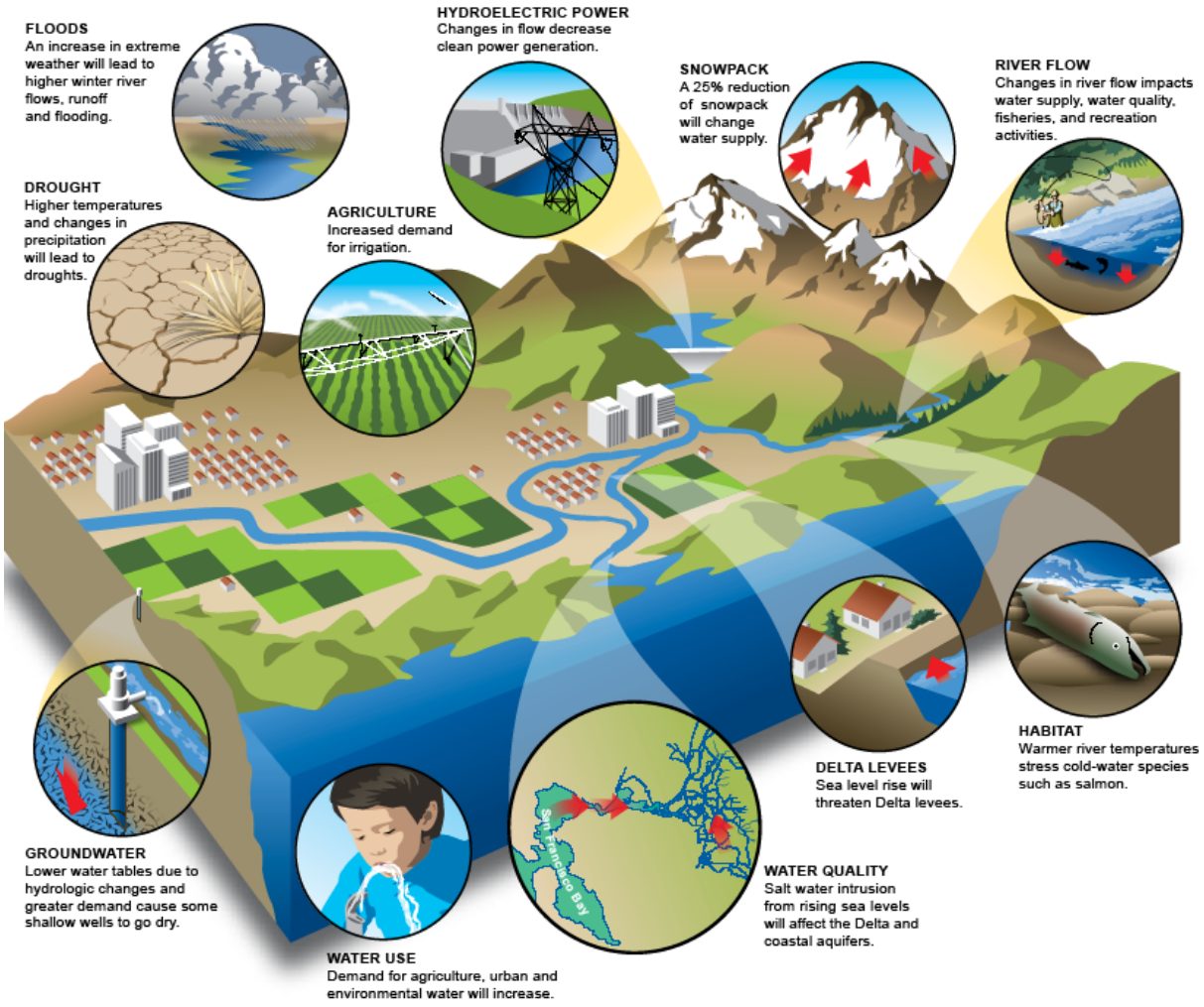
5.2 - Water

Water Supply

The City of Hesperia is served by the Hesperia Water District. The Hesperia Water District manages the City's potable water system. The City derives all of its water supply from underground aquifers through 18 active groundwater wells located throughout the City. In addition to local wells, the City could choose to utilize surface water imported from the State Water Project through the California Aqueduct. The State is currently developing a Delta Conservation Plan that will help ensure reliable delivery of State Water Project supplies to Southern California, including the City of Hesperia and Sphere of Influence.

Figure 10 shows how climate change can impact a watershed. One of the major impacts of climate change is a loss of natural snowpack, particularly the Sierra Nevada snowpack. Snowmelt provides an annual average of 15 million acre-feet of water, released between April and July each year (Department of Water Resources 2008). The California Department of Water Resources projects that the Sierra snowpack will experience a 25- to 40-percent reduction from its historic average by 2050. Climate change is also anticipated to bring warmer storms that result in less snowfall at lower elevations, reducing the total snowpack. The State Water Project receives part of the water supply from the Sierra snowpack; therefore, decreases in snowpack could result in decreases in water available to the State Water Project and to the City of Hesperia.

Figure 10: How Climate Change Impacts a Watershed


FLOODS
An increase in extreme weather will lead to higher winter river flows, runoff and flooding.
HYDROELECTRIC POWER
Changes in flow decrease clean power generation.
SNOWPACK
A 25% reduction of snowpack will change water supply.
RIVER FLOW
Changes in river flow impacts water supply, water quality, fisheries, and recreation activities.
DROUGHT
Higher temperatures and changes in precipitation will lead to droughts.
AGRICULTURE
Increased demand for irrigation.
HABITAT
Warmer river temperatures stress cold-water species such as salmon.
DELTA LEVEES
Sea level rise will threaten Delta levees.
GROUNDWATER
Lower water tables due to hydrologic changes and greater demand cause some shallow wells to go dry.
WATER QUALITY
Salt water intrusion from rising sea levels will affect the Delta and coastal aquifers.
San Francisco Bay
WATER USE
Demand for agriculture, urban and environmental water will increase.

The General Plan has various policies that attempt to encourage water conservation and protect water resources within the City, as shown below.

CN-1.1 Implementation Policy: Promote the use of desert vegetation with low water usage and drought tolerant materials in landscaped areas.

CN-1.2 Implementation Policy: Educate residents on water conservation methods with best practices and tips.

CN-1.3 Implementation Policy: Promote reduced use of high nitrate fertilizers, herbicides, pesticides and other chemicals in landscaping areas that can contaminate the quality of the groundwater.

CN-1.4 Implementation Policy: Limit the disturbance of natural water hydrology by minimizing the creation of impervious surface area and continued utilization of

detention/retention basins and underground retention/detention facilities to recharge groundwater.

CN-1.5 Implementation Policy: Work with local agencies and jurisdictions to provide a coordinated effort to ensure a safe and constant water supply for the region.

CN-1.6 Implementation Policy: Encourage the use of low-water consumption fixtures in homes and businesses.

CN-1.7 Implementation Policy: Require new development to use new technology, features, equipment and other methods to reduce water consumption.

CN-2 Goal: Establish building and development standards to maximize the reclamation of water resources.

CN-2.1 Implementation Policy: Minimize impacts to washes that convey drainage by prohibiting development within drainage corridors that are not consistent with the Master Plan of Drainage.

CN-2.2 Implementation Policy: Encourage the use of reclaimed water for irrigation and other non-potable uses.

CN-2.3 Implementation Policy: Protect open space areas used for recharging groundwater basins.

CN-2.4 Implementation Policy: Continue to implement the use of reclaimed water through the City's "purple pipe" ordinances and regulations to further the use of reclaimed and treated water.

CN-2.5 Implementation Policy: Implement the State and City laws and policies to develop retention basins for the replenishment of the underground water supply.

CN-2.6 Implementation Policy: Coordinate City policies and activities with the Victor Valley Waste Water Reclamation Authority.

SF-4.8 Implementation Policy: The City will work with the Hesperia Water District to monitor the potential presence of perchlorate in well water. If perchlorate continues to be detected at measurable concentrations, programs to find and eradicate the source of this contaminant, and to cleanup the perchlorate already in the water will have to be developed.

Flooding

Changes in precipitation patterns may cause increased flooding. For the purposes of federal flood insurance, the Federal Emergency Management Agency has traditionally used the 100-year flood event, which refers to the level of flood flows that has a 1-percent chance of being exceeded in any single year. As California's hydrology changes, what is currently considered a 100-year flood may strike more often, leaving many communities at greater risk. Moreover, as peak flows and precipitation change over time, climate change calls into

question assumptions of "stationarity" that is used in flood-related statistical analyses like the 100-year flood.

The California Department of Water Resources (2008) recommends the following:

- Local land use agencies should update General Plans to address increased flood risks posed by climate change. General Plans should consider an appropriate risk tolerance and planning horizon for each locality.
- Local governments should site new development outside of undeveloped floodplains unless the floodplain has at least a sustainable, 200-year level of flood protection.
- Local governments should use low-impact development techniques to infiltrate and store runoff.
- Local governments should include flood-resistant design requirements in local building codes. State, federal, and local agencies should develop conjunctive use management plans that integrate floodplain management, groundwater banking, and surface storage. Such plans could help facilitate system reoperation and provide a framework for the development of local projects that are beneficial across regions.
- Local land use agencies should adopt ordinances that protect the natural functioning of groundwater recharge areas.

Many of the undeveloped flood ways and flood plains in the City and sphere of Influence are already designated as Open Space, including the Mojave River, the Oro Grande Wash and the Antelope Valley Wash. The Department of Water Resources' recommendation for a 200-year level of flood protection is not being implemented, as the 100-year standard is consistent with the City's development standards, the Master Plan of Drainage applicable to Hesperia and the entire Victor Valley, as well as the standards of the San Bernardino County Flood Control District.

If precipitation falls in the form of rain rather than snow with greater storm intensity, high frequency flood events may increase. There is currently no known literature that suggests an increase in flooding from climate change in the Hesperia area; however, it is possible that changing weather patterns could result in heavy rain, which could cause flooding. In addition, increased wildfires resulting from climate change could increase floods following fire. The City of Hesperia General Plan contains the following policies, which would reduce flooding impacts.

General Plan Policies

SF-2.1 Implementation Policy: The City shall continue enforcing the City's Municipal Code provisions for flood hazard reduction (Title 8: Safety, Chapter 8.28: Flood Hazard Protection and Regulations). This code, which applies to new construction and existing projects undergoing substantial improvements, provides constructions standards that address the major causes of flood damage, and includes provisions for anchoring, placement of utilities, raising floor elevations, using flood-resistant construction materials, and other methods to reduce flood damage.

SF-2.2 Implementation Policy: The City will require that new discretionary development proposals include, as a condition of approval, hydrological studies prepared by a State-certified engineer that assess the impact that the new development will have on flooding potential of existing development down-gradient. The studies shall provide mitigation measures to reduce this impact to an acceptable level. Single family residences on existing lots should be exempted.

SF-2.3 Implementation Policy: The City shall continue participation in the National Flood Insurance Program and require that all owners of properties located within the 100-year floodplain (Zones A and AE), purchase and keep flood insurance for those properties.

SF-2.4 Implementation Policy: The City will continue to participate in the Storm Ready Program with the National Weather Service, including the monitoring of precipitation and snow levels on the mountains to the south, providing storm watches and warnings in real-time, and issuing evacuation notices for affected neighborhoods in a timely manner, such as with a citizen notification or similar system.

SF-2.5 Implementation Policy: The City will not permit any new facilities that use or store hazardous materials in quantities that would place them in the State's TRI or SQG databases to be located in the flood zone (Zones A and AE), unless all standards of elevation, anchoring and flood proofing have been implemented to the satisfaction of the City's Building Department and the San Bernardino County Fire Department. The hazardous materials shall be stored in watertight containers that are not capable of floating or similar flood-proof receptacles or tanks.

SF-2.6 Implementation Policy: The City will require all essential and critical facilities (including but not limited to essential City offices and buildings, medical facilities, schools, child care centers, and nursing homes) in or within 200 feet of Flood Zones A and AE, or the dam inundation pathways, to develop disaster

response and evacuation plans that address the actions that will be taken in the event of flooding or inundation due to catastrophic failure of a dam.

SF-2.7 Implementation Policy: The City will regulate development in Flood Zones A and AE pursuant to FEMA regulations.

SF-2.8 Implementation Policy: The City will continue to maintain, and improve where needed, the storm drain systems, with an emphasis on those areas of the City that flood repeatedly. This entails maintaining and regularly cleaning the storm drains and other flood-control structures in low-lying areas, as necessary, such that floodwaters can be effectively conveyed away from structures.

SF-2.9 Implementation Policy: The City will identify repetitive flood properties in the City and develop feasible mitigation options for these sites. Funding to implement the mitigation measures may be available through FEMA's Hazard Mitigation Grant and Flood Mitigation Assistance Programs and their Pre-disaster Mitigation Program.

SF-2.10 Implementation Policy: The City will encourage the development of areas in the floodplains as parks, nature trails, equestrian parks, golf courses, or other types of recreational facilities that can withstand periodic inundation, and will offer incentives to developers to retain these areas as open space.

SECTION 6: GLOSSARY OF TERMS AND ACRONYMS

AB	Assembly Bill
ARB	The California Air Resources Board is a part of the California Environmental Protection Agency, an organization that reports directly to the Governor's Office in the Executive Branch of California State Government. The mission of the ARB is to promote and protect public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants while recognizing and considering the effects on the economy of the State.
CEQA	The California Environmental Quality Act is a California statute passed in 1970 to institute a statewide policy of environmental protection.
CO_2	Carbon dioxide: A naturally occurring gas and a by-product of burning fossil fuels and biomass other industrial processes. It is the reference gas against which other greenhouse gases are measured and therefore has a global warming potential of 1.
CAP	Climate Action Plan: A description of the policies and measures that a local government will take to reduce greenhouse gas emissions and achieve its emissions reduction targets. Most plans include a timeline, a description of financing mechanisms, and an assignment of responsibility to departments and staff.
Climate Change	The statistically significant variation either in the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer).
EPA	United States Environmental Protection Agency. The mission of EPA is to protect human health and to safeguard the natural environment—air, water and land—upon which life depends.
Greenhouse Gas	A gas that absorbs infrared radiation in the atmosphere. Greenhouse gases as defined by AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
MDAQMD	Mojave Desert Air Quality Management District
$MTCO_2e$	Metric tons of carbon dioxide equivalents: a measure of greenhouse gas emissions
$MMTCO_2e$	Million metric tons of carbon dioxide equivalents: a measure of greenhouse gas emissions
SB	Senate Bill

SECTION 7: REFERENCES

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Figure 5. Hesperia Community Greenhouse Gas Business as Usual Emissions. Michael Brandman Associates.

Figure 6. Hesperia Government Greenhouse Gas Business as Usual Emissions. Michael Brandman Associates.

Figure 7. Acreage in Hesperia. Data from City of Hesperia General Plan Land Use Element (see Appendix A, Assumptions). Graphed by Michael Brandman Associates.

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Appendix A: Detailed Emission Inventory

Summary of Greenhouse Gas Inventory
City of Hesperia + Sphere of Influence
Prepared by Michael Brandman Associates
Edited July 20, 2010

Population (City + Sphere)	102,896	176,527	243,465

Business as Usual Emissions (MTCO2e/year)

Activity	2009	2020	2030
Transportation: Cars, light and medium	199,414	249,365	302,008
Transportation: Heavy duty trucks	200,392	250,587	303,488
Transportation: Other	7,454	9,321	11,288
Natural Gas	34,507	87,734	136,118
Electricity	135,824	233,019	321,378
Solid Waste	28,394	48,713	67,184
Fireplaces	9,528	16,073	22,023
Refrigerants	23,906	59,836	92,825
Total	**639,419**	**954,646**	**1,256,311**
Per capita emissions	6.2	5.4	5.2

With CAP Strategies (MTCO2e/year)

				Percent Reductions	
Activity	2009	2020	2030	2020	2030
Transportation: Cars, light and medium	199,414	242,881	294,156	2.6%	2.6%
Transportation: Heavy duty trucks	200,392	250,587	303,488	0%	0%
Transportation: Other	7,454	9,321	11,288	0%	0%
Natural Gas	34,507	87,734	136,118	0%	0%
Electricity	135,824	233,019	321,378	0%	0%
Solid Waste	28,394	30,243	41,711	38%	38%
Fireplaces	9,528	16,073	22,023	0%	0%
Refrigerants	23,906	59,836	92,825	0%	0%
Subtotal	**639,419**	**929,693**	**1,222,986**	2.6%	2.7%
Business as usual	639,419	954,646			
Reductions from Statewide Measures	0	226,251		23.7%	
Reductions from CAP-1 (CEQA)	0	25,218		8%	8%
Reductions from other CAP strategies	0	24,953			
Community Emissions with Reductions	639,419	678,223			
Population	102,896	176,527			
Per capita emissions, with Reductions	6.2	3.8			
Reduction Target		3.8			

Assumptions

City of Hesperia, Business as Usual

Prepared by Michael Brandman Associates

Year	2005	% in 2009	2009	2020	2030
Population (City)			88,184		
Population (Sphere)			14,712		
Population (City + Sphere)			102,896	176,527	243,465
SFR (City)		89%	25,617		
MFR (City)		11%	3,198		
SFR (Sphere)			5,098		
MFR (Sphere)			637		
SFR (City + Sphere)			30,715	51,812	70,991
MFR (City + Sphere)			3,835	6,469	8,864
Total Units			34,550	58,281	79,855
Persons per unit (population/unit)			2.98	3.03	3.05
Commercial, Industrial, Office (sq. ft)	6,629,228		20,330,035	58,007,256	92,259,274
Office (sq. ft)	513,828		1,046,369	2,510,857	3,842,210
Commercial/Retail (sq. ft)	2,474,000		10,068,162	30,952,106	49,937,511
Industrial (sq. ft)	3,641,400		9,215,505	24,544,292	38,479,554

Commercial

Type	Assumed FAR	Acres	Square feet
Commercial	0.25	825.3	8,987,517
Main Street and Freeway SP			
Main St SP: Mixed Use- Residential/Office	0.25	33	359,370
Neighborhood Commercial (C1)	0.25	448.54	4,884,601
General Commercial (Pedestrian-C2)	0.35	117.24	1,787,441
Service Commercial (Auto Sales- C3)	0.35	351.54	5,359,579
Regional Commercial (C4)	0.35	1,589.57	24,234,584
Summit Valley (Commercial)	0.25	2.9	31,581
Rancho Los Flores Commercial (C)	0.25	79.9	870,111
Rancho Los Flores Commercial (TC)	0.25	314.3	3,422,727
Total Commercial		**3762.3**	**49,937,511**

Assumptions

Residential

Residential (Non Specific Plan)	Acres	Average Density (du/acre)	Residential Units
General Agricultural	2139.28	(0.0 - 0.2 du/ac)	
Limited Agricultural- 2½	792.34	(0.21 - 0.4 du/ac)	
Limited Agricultural- 1	4162.38	(0.41 - 1.0 du/ac)	
Rural Residential- 2 1/2	13173.21	(0.0 - 0.4 du/ac)	
Rural Residential-Special Development	9131.41	(0.0 - 0.4 du/ac)	
Rural Residential-1	2737.13	(0.41 - 1.0 du/ac)	
Rural Residential-20,000	3210.77	(1.1 - 2.0 du/ac)	
Single-Family Residence- 18,000	4640.89	(2.1 - 2.4 du/ac)	
Single-Family Residence	744.73	(2.5 - 4.5 du/ac)	
Single-Family Residence- 4,500	438.77	(4.6 - 8.0 du/ac)	
Multiple Family Residential	140.55	(8.1 - 15.0 du/ac)	
Rancho Las Flores Specific Plan			
Equestrian Residential	869.8	0.8	737
Very Low Density	468.8	0.5	220
Low Density	1,074.4	3.6	3,843
Low Medium Density	905.9	5.4	4,915
Medium Density Residential	402.5	8.3	3,331
Medium High Density	121.9	12.7	1,553
High Density	85.0	24.9	2,116
Summit Valley Ranch Specific Plan			
7,000 sq. ft. lots	81.1	3-4.1	277
6,000 sq. ft. lots	76.3	3.7-4.5	315
5,000 sq. ft. lots	49.3	4.6-5.3	248
Duplex	39.6	6.5-7.5	277
Townhouse/Condominium	21.4	13.8	295
Apartments	13.4	19.1	256
Main Street and Freeway Corridor Specific Plan			
Low Density Residential (R1)	1,450.8	average = 4	6,239
Very Low Density Residential (R1-18000)	98.8	0.5-2	85
Rural Residential (RR-1)	813.7	0-0.5	350
Medium Density Residential (MFR R3)	1,066.4	8 to 15	11,005
High Density Residential (MFR R4)	183.9	15-20	2,848
Mixed Use	33.4	average = 8	315
Regional Commercial (High Density)		15-25	5547
Total	**49,167.9**		

Summary (w/ SP)	Acres
Less than 1 du/ac	34,288.1
1 - 2.4 du/ac	7,950.5
2.5 - 4.5 du/ac	3,427.3
4.6+ du/ac	3,502.0
Total	49,167.86

Summary (no SP)	Acres
Less than 1 du/ac	32,135.75
1 - 2.4 du/ac	7,851.66
2.5 - 4.5 du/ac	744.73
4.6+ du/ac	579.32
Total	41,311.46

		Assumptions	
Other			
Public (General Plan)		2201.0	
Other (General Plan)		4488.9	
Freeway Corridor SP: Parks		267.0	
Freeway Corridor SP: Government, Schools		208.0	
Rancho Los Flores SP: Public Use, Open Space, etc.		5662.9	
Summit Valley SP: Recreational, public facilities		429.8	
Total		**13257.6**	
Industrial			
Limited Manufacturing (I1)	0.40	235.0	4,095,337
General Manufacturing (I2)	0.25	487.6	5,310,400
Main St. SP: Limited Manufacturing (I1)	0.40	1,150.92	20,053,630
Main St. SP: General Manufacturing (I2)	0.25	828.3	9,020,187
Total		**2,702**	**38,479,554**
Office			
Main St SP: Office (OF)	0.25	345.92	3,767,069
Summit Valley (Office Professional)	0.25	6.9	75,141
Total		**353**	**3,842,210**

Abbreviations:
SFR = single family residential, MFR = multi family residential, SOI = sphere of influence
EIR = Environmental Impact Report for the City of Hesperia General Plan Update (2010)

Notes:
- Population for the City for 2009, % in 2009, and units in 2009 are from the City of Hesperia 2008-2014 Housing Element, dated December 2009 (Table 15)
- Population for SOI is from EIR
- Population for 2030 is from the General Plan; population in 2020 is interpolated from 2009 and 2030 population
- Units for SOI in 2009 is from the EIR
- 2030 residential units is from the EIR
- 2005 data from the Economic Conditions and Trends, City of Hesperia General Plan Update, prepared by Stanley R. Hoffman Associates, 2006.

- Residential (non specific plan) is from the Land Use Element
- Residential Specific Plan units are from the City of Hesperia 2008-2014 Housing Element, December 2009 (Table 35 and Table 36)
- Year 2030 residential units is from the EIR
- Year 2020 residential units is interpolated from 2030 and 2009 residential units.

- Non specific plan Commercial and Industrial acres are from General Plan Land Use Element (Table 7).
- Assumed floor area ratio (FAR) is assumed based on the range of allowed FAR, which ranges between 0 and 1 or 0 and 0.5 FAR.
- Specific Plan information is from the Housing Element, dated December 2009
- "Other" is from the Land Use Element
- Industrial land uses are from the Lane Use Element
- Commercial and industrial total for years 2009 and 2020 interpolated from years 2005 and 2030

Electricity - Indirect Emissions

Project: City of Hesperia
Prepared by: Michael Brandman Associates
Prepared on: 4/27/2010

2007 and 2009 Electricity: City of Hesperia (not including sphere of influence)

Rate Group	2007 Electricity Use (kWh/year)	2009 Electricity Use (kWh/year)	2009 Percentage
Time of use agricultural pumping	28,203,637	25,431,749	7%
Domestic	211,472,892	205,309,988	58%
General service non demand (GS-1)	24,971,913	23,633,195	7%
General service demand (GS-2)	60,725,631	58,163,740	16%
Street lighting	6,048,440	6,510,808	2%
Time of use general service (TOU-GS)	29,226,347	33,810,940	10%
Total (kWh/year)	**360,648,860**	**352,860,420**	
Total (MWh/year)	**360,649**	**352,860**	

Greenhouse Gas	Emission Factor (pounds per MWh)	2009 Emissions (pounds/year)	2009 Emissions (tons/year)	2009 Emissions (MTCO2e/year)
Carbon dioxide	724.12	255,513,287	127,757	115901
Methane	0.0302	10656	5.33	102
Nitrous oxide	0.0081	2858	1.43	402
Total: City only		*255,526,802*	*127,763*	*116,404*
Population: City only				*88,184*
Per capita emissions in 2009 (MTCO2e/person/year)				*1.32*

Interpolation Based on Per Capita City Emissions in 2009

Area	Year	Estimated Population	MTCO2e/year
City + Sphere	2009	102,896	135,824
City + Sphere	2020	176,527	233,019
City + Sphere	2030	243,465	321,378

Notes:

Emission factor source: California Climate Action Registry. General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 3.1, January 2009. Table C.2
www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Electricity use source for 2007: Southern California Edison. Electricity Use Report for Hesperia, Year 2007. Version 5.0. April 26, 2010.

Electricity source for 2009: Southern California Edison. Electricity Use Report for Hesperia, Year 2009. Version 5.0. April 26, 2010. Summary of Results, Table C, January 1, 2009 - December 31, 2009

Municipal Electricity

Project: City of Hesperia
Prepared by: Michael Brandman Associates
Prepared on: 4/27/2010

Greenhouse Gas	Emission Factor (pounds per MWh)	Global Warming Potential
Carbon dioxide	724.12	1
Methane	0.0302	21
Nitrous oxide	0.0081	310

2007

Source	Electricity Use (kWh/year)	Carbon Dioxide (MTCO2e per year)	Methane (MTCO2e per year)	Nitrous Oxide (MTCO2e per year)	Total (MTCO2e per year)
Library and related buildings	1,410,074	463	0.41	1.61	465
Street lighting	212,018	70	0.06	0.24	70
Animal control	144,720	48	0.04	0.16	48
Offices	229,307	75	0.07	0.26	76
Other	27,908	9	0.01	0.03	9
Total	**2,024,027**	**665**	**0.58**	**2.31**	**668**

2009

Source	Electricity Use (kWh/year)	Carbon Dioxide (MTCO2e per year)	Methane (MTCO2e per year)	Nitrous Oxide (MTCO2e per year)	Total (MTCO2e per year)
Library and related buildings	1,506,227	495	0.43	1.72	497
Street lighting	203,582	67	0.06	0.23	67
Animal control	140,130	46	0.04	0.16	46
Offices	137,779	45	0.04	0.16	45
Other	54,709	18	0.02	0.06	18
Total	**2,042,427**	**671**	**0.59**	**2.33**	**674**

Notes:

Emission factor source: California Climate Action Registry. General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 3.1, January 2009. Table C.2 www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Electricity use source: Southern California Edison. Provided on April 27, 2010

Natural Gas Combustion

Industrial
City of Hesperia Greenhouse Gas Inventory
Prepared by Michael Brandman Associates

Year	Gas	Type of Land Use	Square Feet	Annual Natural Gas Usage Factor* (kBTU/sf)	Natural Gas Usage for Project (MMBTU/year)	Emission Factor (kg/MMBTU)**	Emissions (kg/year)	Emissions (tons/year)	Emissions (MTCO2e/year)
2009	Methane	All warehouses	9215505	3.44	31701	0.005	159	0.174	3
	Nitrous Oxide	All warehouses	9215505	3.44	31701	0.0001	3	0.0035	1
	Carbon Dioxide	All warehouses	9215505	3.44	31701	71.42	2264109	2491	2259
	Total								***2264***
2020	Methane	All warehouses	24544292	3.44	84432	0.005	422	0.464	9
	Nitrous Oxide	All warehouses	24544292	3.44	84432	0.0001	8	0.0093	3
	Carbon Dioxide	All warehouses	24544292	3.44	84432	71.42	6030160	6633	6018
	Total								***6029***
2030	Methane	All warehouses	38479554	3.44	132370	0.005	662	0.728	14
	Nitrous Oxide	All warehouses	38479554	3.44	132370	0.0001	13	0.0146	4
	Carbon Dioxide	All warehouses	38479554	3.44	132370	71.42	9453841	10399	9434
	Total								***9452***

Greenhouse Gas	Global Warming Potentials
Methane	21
Nitrous Oxide	310
Carbon Dioxide	1

* Natural gas usage: Table E-1 from California Energy Commission. California Commercial End-Use Survey. Consultant Report. March 2006. CEC-400-2006-005

** Emission factors: Table C.8 from California Climate Action Registry, General Reporting Protocol. Version 3.1, January 2009. www.climateregistry.org/tools/protocols/general-reporting-protocol.html

Table E-1: Overview of Energy Usage in the Statewide Service Area

Building Type	Floor Stock (kft^2)	Annual Energy Intensities			Total Annual Usage	
		Electricity (kWh/ft^2)	Natural Gas (therms/ft^2)	Natural Gas (kBtu/ft^2)	Electricity (GWh)	Natural Gas (Mtherms)
All Commercial	4,920,114	13.63	0.26	25.99	67077	1278.60
Small Office (<30k ft^2)	361,584	13.10	0.11	10.54	4736	38.10
Large Office (>=30k ft^2)	660,429	17.70	0.22	21.93	11691	144.80
Restaurant	148,892	40.20	2.10	209.96	5986	312.60
Retail	702,053	14.06	0.05	4.62	9871	32.50
Food Store	144,209	40.99	0.26	27.60	5911	39.80
Refrigerated Warehouse	95,540	20.02	0.06	5.60	1913	5.30
Unrefrigerated Warehouse	554,166	4.45	0.03	3.07	2467	17.00
School	445,106	7.46	0.16	15.97	3322	71.10
College	205,942	12.26	0.34	34.24	2524	70.50
Health	232,606	19.61	0.76	75.53	4561	175.70
Lodging	270,044	12.13	0.42	42.40	3275	114.50
Miscellaneous	1,099,544	9.84	0.23	23.34	10817	256.60
All Offices	1,022,012	16.08	0.18	17.90	16430	182.90
All Warehouses	649,706	6.74	0.03	3.44	4380	22.40

Natural Gas Combustion

Commercial and Office
City of Hesperia Greenhouse Gas Inventory
Prepared by Michael Brandman Associates

Year	Gas	Type of Land Use	Square Feet	Annual Natural Gas Usage Factor* (kBTU/sf)	Natural Gas Usage for Project (MMBTU/year)	Emission Factor (kg/MMBTU)**	Emissions (kg/year)	Emissions (tons/year)	Emissions (MTCO2e/year)
2009	Methane	All commercial	11114531	25.99	288867	0.005	1444.3	1.589	30
	Nitrous Oxide	All commercial	11114531	25.99	288867	0.0001	28.9	0.0318	9
	Carbon Dioxide	All commercial	11114531	25.99	288867	71.42	20630857	22694	20588
	Total								***20627***
2020	Methane	All commercial	33462964	25.99	869702	0.005	4348.5	4.783	91
	Nitrous Oxide	All commercial	33462964	25.99	869702	0.0001	87.0	0.0957	27
	Carbon Dioxide	All commercial	33462964	25.99	869702	71.42	62114147	68326	61985
	Total								***62103***
2030	Methane	All commercial	53779721	25.99	1397735	0.005	6988.7	7.688	146
	Nitrous Oxide	All commercial	53779721	25.99	1397735	0.0001	139.8	0.1538	43
	Carbon Dioxide	All commercial	53779721	25.99	1397735	71.42	99826229	109809	99619
	Total								***99808***

Greenhouse Gas	Global Warming Potentials
Methane	21
Nitrous Oxide	310
Carbon Dioxide	1

* Natural gas usage: Table E-1 from California Energy Commission. California Commercial End-Use Survey. Consultant Report. March 2006. CEC-400-2006-005

** Emission factors: Table C.8 from California Climate Action Registry, General Reporting Protocol. Version 3.1, January 2009.
www.climateregistry.org/tools/protocols/general-reporting-protocol.html

Table E-1: Overview of Energy Usage in the Statewide Service Area

Building Type	Floor Stock (kft^2)	Annual Energy Intensities			Total Annual Usage	
		Electricity (kWh/ft^2)	Natural Gas (therms/ft^2)	Natural Gas (kBtu/ft^2)	Electricity (GWh)	Natural Gas (Mtherms)
All Commercial	4,920,114	13.63	0.26	25.99	67077	1278.60
Small Office (<30k ft^2)	361,584	13.10	0.11	10.54	4736	38.10
Large Office (>=30k ft^2)	660,429	17.70	0.22	21.93	11691	144.80
Restaurant	148,892	40.20	2.10	209.96	5986	312.60
Retail	702,053	14.06	0.05	4.62	9871	32.50
Food Store	144,209	40.99	0.26	27.60	5911	39.80
Refrigerated Warehouse	95,540	20.02	0.06	5.60	1913	5.30
Unrefrigerated Warehouse	554,166	4.45	0.03	3.07	2467	17.00
School	445,106	7.46	0.16	15.97	3322	71.10
College	205,942	12.26	0.34	34.24	2524	70.50
Health	232,606	19.61	0.76	75.53	4561	175.70
Lodging	270,044	12.13	0.42	42.40	3275	114.50
Miscellaneous	1,099,544	9.84	0.23	23.34	10817	256.60
All Offices	1,022,012	16.08	0.18	17.90	16430	182.90
All Warehouses	649,706	6.74	0.03	3.44	4380	22.40

Natural Gas Combustion

Residential Developments
City of Hesperia Greenhouse Gas Inventory
Prepared by Michael Brandman Associates

Global Warming Potentials	
Methane	21
Nitrous Oxide	310
Carbon Dioxide	1

Year	Gas	Units	Natural Gas Usage Factor* (therms/unit/year)	Natural Gas Usage (MMBTU/year)	Emission Factor (kg/MMBTU)**	Emissions (kg/year)	Emissions (tons per year)	Emissions (MTCO2e per year)
2009	Methane	34,550	471	162731	0.005	814	0.9	17
	Nitrous Oxide	34,550	471	162731	0.0001	16	0.0	5
	Carbon Dioxide	34,550	471	162731	71.42	11622212	12784	11598
	Total							***11620***
2020	Methane	58,281	471	274504	0.005	1373	1.5	29
	Nitrous Oxide	58,281	471	274504	0.0001	27	0.0	8
	Carbon Dioxide	58,281	471	274504	71.42	19605105	21566	19564
	Total							***19602***
2030	Methane	79,855	471	376117	0.005	1881	2.1	39
	Nitrous Oxide	79,855	471	376117	0.0001	38	0.0	12
	Carbon Dioxide	79,855	471	376117	71.42	26862280	29549	26806
	Total							***26857***

* California Energy Commission. Energy Almanac. California Residential Natural Gas Consumption. Average Therms in 2007, state average. http://energyalmanac.ca.gov/naturalgas/residential_natural_gas_consumption.html, Accessed April 29, 2010.

** Emission factors: Table C.8 from California Climate Action Registry, General Reporting Protocol. Version 3.1, January 2009. www.climateregistry.org/tools/protocols/general-reporting-protocol.html

Conversion factor for stationary combustion calculations from Table III.8.1 in California Climate Action Registry, General Reporting Protocol. Version 3.1, January 2009. www.climateregistry.org/tools/protocols/general-reporting-protocol.html. 1 therm of natural gas multiplied by 0.1 = MMBTU (one million British thermal units)

Fireplace Emissions
City of Hesperia + Sphere of Influence
Prepared by Michael Brandman Associates
Edited 7/20/2010

Year	2009	2020	2030
Population	102,896	176,527	243,465
SFR	30,715	51,812	70,991
MFR	3,835	6,469	8,864

Wood Stove Assumptions	
Wood burned (cords/yr/stove)	0.49
Pounds in a cord of wood	2458
Percent noncatalytic	50%
Percent catalytic	50%

Emission Factors	CO2
Natural Gas (lbs/MMBTU)	117.6
Noncatalytic wood stove (lbs/ton fuel)	3400
Catalytic wood stove (lbs/ton fuel)	3400
Wood fireplace (lbs/ton fuel)	3400

Natural Gas Assumptions	BTU/year	MMBTU/ year
SFR	2250000	2.25
MFR	1500000	1.50

Wood Fireplace Assumptions	
Wood burned (cords/yr/fireplace)	0.22
Pounds in cord of wood (lbs)	2458

	2009 Percentage			2009			2020			2030		
Business as Usual	Wood stoves	Natural gas fireplaces	Wood Fireplaces	Wood stoves	Natural gas fireplaces	Wood Fireplaces	Wood stoves	Natural gas fireplaces	Wood Fireplaces	Wood stoves	Natural gas fireplaces	Wood Fireplaces
SFR	5%	40%	55%	1536	12286	16893	2591	20725	28497	3550	28396	39045
MFR	5%	40%	55%	192	1534	2109	323	2588	3558	443	3546	4875
With Fireplace Ordinance												
SFR				1536	12286	16893	1536	33383	16893	1536	52562	16893
MFR				192	1534	2109	192	4168	2109	192	6563	2109

CO2 Emissions (tons/year)	Business as Usual		
Year	**2009**	**2020**	**2030**
Wood Stoves			
SFR - Noncatalytic	786	1326	1817
SFR - Catalytic	786	1326	1817
MFR - Noncatalytic	98	166	227
MFR - Catalytic	98	166	227
Wood Fireplaces			
SFR	7765	13098	17947
MFR	970	1635	2241
Total (tons/year)	**10503**	**17717**	**24275**
Total (MTCO2e/year)	**9528**	**16073**	**22023**

Notes for Fireplace Emissions
SFR = single family residential dwelling unit; MFR = multi-family residential dwelling unit; MCF = million cubic feet
- Wood stove, natural gas, and fireplace assumptions from URBEMIS2007 (for San Bernardino County)
- Emission factors from URBEMIS2007
- 2009 percentage from personal conversation with City of Hesperia planning department.
- Natural gas emission factor: US EPA AP-42. Section 1.4, Natural Gas Combustion. www.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf

Fugitive Refrigerant Operating Emissions

City of Hesperia, Business as Usual

Prepared by Michael Brandman Associates

Global Warming Potentials	
Refrigerants	3785
A/C	1725

Type of Unit	Units	Type of System	Capacity of Unit (pounds)	Annual Leak Rate in percent of capacity	Emissions (pounds/year)	Emissions (tons/year)	Emissions (MTCO2e/yr)
Year 2009							
Refrigeration: Residential	34,550	RES	1	0.5%	173	0.09	297
Refrigeration: Commercial/Ind.	203	SRCU	122	14%	3472	1.74	5,962
Refrigeration: Large Grocery Stores	6	LCS	2486	21%	3132	1.57	5,378
A/C: Residential	34,550	RES	1	10%	3455	1.73	2,703
A/C: Commercial	1,111	SU	100	11%	12226	6.11	9,566
A/C: Industrial	922	SU	100	11%	10137	5.07	7,932
Total					**22458**	**11.23**	**23,906**
Year 2020							
Refrigeration: Residential	58,281	RES	1	0.5%	291	0.15	500
Refrigeration: Commercial/Ind.	580	SRCU	122	14%	9908	4.95	17,010
Refrigeration: Large Grocery Stores	10	LCS	2486	21%	5221	2.61	8,963
A/C: Residential	58,281	RES	1	10%	5828	2.91	4,560
A/C: Commercial	3,346	SU	100	11%	36809	18.40	28,802
A/C: Industrial	2,454	SU	100	11%	26999	13.50	21,125
Total					**58057**	**29.03**	**59,836**
Year 2030							
Refrigeration: Residential	79,855	RES	1	0.5%	399	0.20	686
Refrigeration: Commercial/Ind.	923	SRCU	122	14%	15758	7.88	27,054
Refrigeration: Large Grocery Stores	14	LCS	2486	21%	7309	3.65	12,548
A/C: Residential	79,855	RES	1	10%	7986	3.99	6,248
A/C: Commercial	5,378	SU	100	11%	59158	29.58	46,289
A/C: Industrial	3,848	SU	100	11%	42328	21.16	33,120
Total					**90609**	**45.30**	**92,825**

1 commercial/ind. Refrig. Unit per:	100000 square feet	1 commercial A/C unit per:	10000 square feet
1 industrial A/C unit per:	10000 square feet		

- Source for general methodology and residential A/C leak rates: U.S. Environmental Protection Agency, Climate Leaders. May 2008. Direct HFC and PFC Emissions from Use of Refrigeration and Air Conditioning Equipment. EPA430-K-03-004. www.epa.gov/stateply/documents/resources/mfgrfg.pdf
- Global warming potential for refrigeration assumed to be R404a (GWP = 3300) from Forane 404a technical data sheet, April 2006, www.arkema-inc.com/tds/451.pdf; for A/C (air conditioning) assumed to be R410a (GWP = 1725).
- Assumed residential units have one refrigeration and A/C per unit. Grocery stores determined by a Yahoo! Local search within Hesperia.
- Annual leak rate (for all except residential A/C) in percent of capacity and capacity: California Air Resources Board. Public Hearing Notice and Related Material. Appendix B, California Facilities and Greenhouse Gas Emissions Inventory – High-Global Warming Potential Stationary Source Refrigerant Management Program www.arb.ca.gov/regact/2009/gwprmp09/refappb.pdf. Leak rates are from Table 8. Capacity is from information on pages 3 and 4 and Table 4.
- Type of System: LCS - large centralized refrigeration system; SRCU - small refrigeration condensing units; SU - small unitary air conditioning system; RES - residential.

Fugitive Refrigerant Operating Emissions

City of Hesperia, with Regulations

Prepared by Michael Brandman Associates

Global Warming Potentials	
Refrigerants	3785
A/C	1725

Type of Unit	Units	Type of System	Capacity of Unit (pounds)	Annual Leak Rate in percent of capacity	Emissions (pounds/year)	Emissions (tons/year)	Emissions (MTCO2e/yr)
Year 2009							
Refrigeration: Residential	34,550	RES	1	0.5%	173	0.09	297
Refrigeration: Commercial/Ind.	203	SRCU	122	14%	3472	1.74	5,962
Refrigeration: Large Grocery Stores	6	LCS	2486	21%	3132	1.57	5,378
A/C: Residential	34,550	RES	1	10%	3455	1.73	2,703
A/C: Commercial	1,111	SU	100	11%	12226	6.11	9,566
A/C: Industrial	922	SU	100	11%	10137	5.07	7,932
Total					**22458**	**11.23**	**23,906**
Year 2020							
Refrigeration: Residential	58,281	RES	1	0.5%	291	0.15	500
Refrigeration: Commercial/Ind.	580	SRCU	122	5%	3538	1.77	6,075
Refrigeration: Large Grocery Stores	10	LCS	2486	10%	2486	1.24	4,268
A/C: Residential	58,281	RES	1	10%	5828	2.91	4,560
A/C: Commercial	3,346	SU	100	5%	16731	8.37	13,092
A/C: Industrial	2,454	SU	100	5%	12272	6.14	9,602
Total (with Regulations)					**28875**	**14.44**	**28,496**
Business as Usual							**59,836**
Reduction from Regulations							**52.4%**
Year 2030							
Refrigeration: Residential	79,855	RES	1	0.5%	399	0.20	686
Refrigeration: Commercial/Ind.	923	SRCU	122	5%	5628	2.81	9,662
Refrigeration: Large Grocery Stores	14	LCS	2486	10%	3480	1.74	5,975
A/C: Residential	79,855	RES	1	10%	7986	3.99	6,248
A/C: Commercial	5,378	SU	100	5%	26890	13.44	21,040
A/C: Industrial	3,848	SU	100	5%	19240	9.62	15,054
Total					**44383**	**22.19**	**43,612**

1 commercial/ind. Refrig. Unit per:	100000	square feet	1 commercial A/C unit per:	10000	square feet
1 industrial A/C unit per:	10000	square feet			

Note:

The sources and notes are the same as for the Business as Usual scenario, except that the leak rates have been reduced pursuant to information in the document: California Air Resources Board. Public Hearing Notice and Related Material. Appendix B, California Facilities and Greenhouse Gas Emissions Inventory – High-Global Warming Potential Stationary Source Refrigerant Management Program www.arb.ca.gov/regact/2009/gwprmp09/refappb.pdf.

Vehicle Emissions
Emission Inventory for City of Hesperia, CA
Prepared by Michael Brandman Associates

Vehicle Miles Traveled - 2008/2009

Daily rural+urban VMT in Hesperia	1,280,750	miles per day	Ref 1
Highway miles in Hesperia	24.7	miles	Ref 2
Highway miles in SB County	1,189	miles	Ref 1
% Hesperia highway miles in SB County	2.1%		
Total Daily highway VMT in SB County	35,884,050	miles per day	Ref 1
Highway daily VMT in Hesperia	745,202	miles per day	
Percent highway attributable to Hesperia	50%		
VMT in Hesperia	**1,653,351**	**miles per day**	
Annual rural+urban+highway VMT in Hesperia	603,473,150	miles per year	
% Hesperia rural+urban+highway of SB County highway	4.6%		

Assumption 1: VMT estimates in 2008 are applicable to 2009

Estimate of Vehicle Miles Traveled

Assumption 2: % Hesperia VMT to SB County is the same as % Hesperia VMT to MDAB
% Hesperia rural+urban+highway of SB County highway 4.6%

	(Ref 3)	(Ref 3)		
	MDAB VMT/day	**MDAB VMT/year**	**Hesperia VMT/day**	**Hesperia VMT /year**
2020	44,739,000	16,329,735,000	2,061,341	752,389,579
2030	54,122,000	19,754,530,000	2,493,661	910,186,387

EMFAC2007 BURDEN Calculations of Emissions and VMT for the MDAB - 2009 Ref 3

Pollutant	**MDAB Emissions (tons/day)**	**2009 MDAB VMT/day**	**Emission Factor (grams/mile)**
CO2	24770	33,821,000	665
CH4	1.89	33,821,000	0.05

Percentage of Emissions Based on Population difference - Existing and Proposed GP

	2009	2020	2030
Total Population	102896	176527	243465
Increase (GP)	0	526	1,005
Percent change	0.00%	0.30%	0.41%

On-road Vehicle Exhaust Emissions

Existing			
	2009	**2020**	**2030**
Pollutant	**(tons/year)**	**(tons/year)**	**(tons/year)**
CO2	441,975	551,039	666,607
CH4	34	42	51
N2O	20	25	30
Total	*442,028*	*551,106*	*666,688*
Total (MTCO2e)	*407,138*	*507,606*	*614,064*

New with Proposed General Plan (with percent change)			
	2009	**2020**	**2030**
Pollutant	**(tons/year)**	**(tons/year)**	**(tons/year)**
CO2	-	1,643	2,752
CH4	-	0.13	0.21
N2O	-	0.07	0.12
Total	-	*1,643*	*2,752*
Total (MTCO2e)	-	*1,514*	*2,535*

Existing + Proposed			
	2009	**2020**	**2030**
Pollutant	**(tons/year)**	**(tons/year)**	**(tons/year)**
CO2	441,975	552,682	669,359
CH4	34	42	51
N2O	20	25	30
Total	*442,028*	*552,749*	*669,440*
Total (MTCO2e)	*407,138*	*509,119*	*616,599*

Emissions per Vehicle Class (MTCO2e)

(Ref 4)

%	**Vehicle Class**	**2009**	**2020**	**2030**
20%	Automobiles	81,990	102,527	124,171
20%	Light Duty Trucks	82,601	103,291	125,096
9%	Medium Duty Trucks	34,824	43,547	52,740
49%	Heavy Duty Trucks	200,392	250,587	303,488
2%	Other	7,454	9,321	11,288
	Total	*407,260*	*509,272*	*616,784*

References for Vehicle Emissions Spreadsheet

Reference 1: California Department of Transportation, 2009. 2008 California Public Road Data; http://www.dot.ca.gov/hq/tsip/hpms/hpmslibrary/hpmspdf/2008PRD.pdf

Reference 2: Google Earth highway lengths in the City of Hesperia and Sphere of Influence

Reference 3: EMFAC2007 BURDEN Model for the Mojave Desert Air Basin; emission factors derived by the dividing the daily emission totals by the daily VMT from all vehicle classes

Reference 4: Vehicle percentages are from the EMFAC2007 BURDEN Model for the Mojave Desert Air Basin; see next spreadsheet

Abbreviations

MDAB = Mojave Desert Air Basin, VMT = vehicle miles traveled, SB = San Bernardino, CH4 = methane

MTCO2e = metric tons of carbon dioxide equivalents, calculated by multiplying the tons by the global warming potential (CH4 = 21) and converting to metric tons, multiplying by 0.9072

N2O = nitrous oxide (see separate worksheets for emissions estimations)

EMFAC Burden Carbon Dioxide Emissions

Title : Burden 2020 MDAB
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/04/14 22:13:27
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : January
Area : Mojave Desert Air Basin Average
I/M Stat : Enhanced Basic (2005) -- Using I/M schedule for area 69 San Bernardino (MD)
Emissions: Tons Per Day

****

Emissions
Carbon Dioxide (000)

	LDA-TOT	LDT1-TOT	LDT2-TOT	MDV-TOT	LHDT1-TOT	LHDT2-TOT	MHDT-TOT	HHDT-TOT	OBUS-TOT	SBUS-TOT	UB-TOT	MH-TOT	MCY-TOT	ALL-TOT
Total Ex	6.71	2.67	4.09	2.85	0.67	0.24	0.68	14.81	0.05	0.14	0.06	0.21	0.15	33.32
Percent of total	20%	8%	12%	9%	2%	1%	2%	44%	0%	0%	0%	1%	0%	

****

Summary

Automobiles	20%
Light Duty Trucks	20%
Medium Duty Trucks	9%
Heavy Duty Trucks	49%
Other	2%
Total	100%

Mobile Emissions - Nitrous Oxide

Year 2008/2009 **Vehicle Miles Traveled** 1,653,351

Prepared by Michael Brandman Associates **Total Trips** 82668 (20 miles/trip)

Edited July 20, 2010

	Pounds/day	Tons/day	Tons/year	MTCO2e/yr
Starting Emissions	21.30	0.0106	3.89	1093
Running Emissions	86.56	0.0433	15.80	4443
Total	107.86	0.0539	19.68	5536

Vehicle Percentages

Vehicle Type	Percent	Non-Catalyst	Catalyst	Diesel
Automobile	20.1	0.6	99.2	0.2
Light and medium duty trucks	28.8	1.4	95.9	2.7
Heavy duty trucks and buses	49.2	0.4	99.6	0.0
Motorcycle	1.8	0.9	99.1	0.0

Running Emission Factors (mg/km)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	8	20	1
Light duty truck	9	26	1
Heavy duty trucks and buses	20	55	3
Motorcycle	3	3	3

Running Emission Factors (g/mile)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	0.0050	0.0124	0.0006
Light and medium duty trucks	0.0056	0.0162	0.0006
Heavy duty trucks and buses	0.0124	0.0342	0.0019
Motorcycle	0.0019	0.0019	0.0019

Running Emissions (pounds per day)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	0.02	9.03	0.00
Light and medium duty trucks	0.08	16.25	0.02
Heavy duty trucks and buses	0.09	60.94	0.00
Motorcycle	0.00	0.12	0.00
Total	0.19	86.35	0.02

Starting Emission Factors (mg/start)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	**28**	72	0
Light duty truck	**9**	26	-1
Heavy duty trucks and buses	**70**	194	-2
Motorcycle	**12**	12	0

Starting Emission Factors (g/start)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	0.028	0.072	0
Light duty truck	0.009	0.026	-0.001
Heavy duty trucks and buses	0.07	0.194	-0.002
Motorcycle	0.012	0.012	0

Trip Distribution

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	99.9	16514.5	33.3
Light duty truck	333.8	22865.0	643.8
Heavy duty trucks and buses	162.8	40526.0	0.0
Motorcycle	13.6	1499.8	0.0

Starting Emissions (pounds per day)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Automobile	LDA	0.0062	2.6159	0.0000
Light duty truck	LDT1	0.0066	1.3079	-0.0014
Heavy duty trucks and buses	LDT2	0.0251	17.2965	0.0000
Motorcycle	MDV	0.0004	0.0396	0.0000
Total		0.0382	21.2598	-0.0014

Emission Factors (mg/km and mg/start): 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Table 3.2.3, www.ipcc-nggip.iges.or.jp/EFDB/find_ef_main.php

Mobile Emissions - Nitrous Oxide

Year 2020 **Vehicle Miles Traveled** 2,061,341

Prepared by Michael Brandman Associates **Total Trips** 103067 (20 miles/trip)

Edited July 20, 2010

	Pounds/day	Tons/day	Tons/year	MTCO2e/yr
Starting Emissions	26.55	0.0133	4.85	1363
Running Emissions	107.92	0.0540	19.70	5539
Total	134.48	0.0672	24.54	6902

Vehicle Percentages

Vehicle Type	Percent	Non-Catalyst	Catalyst	Diesel
Automobile	20.1	0.6	99.2	0.2
Light duty truck	28.8	1.4	95.9	2.7
Heavy duty trucks and buses	49.2	0.4	99.6	0.0
Motorcycle	1.8	0.9	99.1	0.0

Running Emission Factors (mg/km)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	8	20	1
Light duty truck	9	26	1
Heavy duty trucks and buses	20	55	3
Motorcycle	3	3	3

Running Emission Factors (g/mile)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	0.0050	0.0124	0.0006
Light duty truck	0.0056	0.0162	0.0006
Heavy duty trucks and buses	0.0124	0.0342	0.0019
Motorcycle	0.0019	0.0019	0.0019

Running Emissions (pounds per day)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	0.03	11.26	0.00
Light duty truck	0.10	20.27	0.02
Heavy duty trucks and buses	0.11	75.98	0.00
Motorcycle	0.00	0.15	0.00
Total	0.24	107.66	0.02

Starting Emission Factors (mg/start)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	**28**	72	0
Light duty truck	**9**	26	-1
Heavy duty trucks and buses	**70**	194	-2
Motorcycle	**12**	12	0

Starting Emission Factors (g/start)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	0.028	0.072	0
Light duty truck	0.009	0.026	-0.001
Heavy duty trucks and buses	0.07	0.194	-0.002
Motorcycle	0.012	0.012	0

Trip Distribution

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	124.5	20589.7	41.5
Light duty truck	416.2	28507.4	802.6
Heavy duty trucks and buses	202.9	50526.4	0.0
Motorcycle	17.0	1869.9	0.0

Starting Emissions (pounds per day)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Automobile	LDA	0.0077	3.2614	0.0000
Light duty truck	LDT1	0.0082	1.6306	-0.0018
Heavy duty trucks and buses	LDT2	0.0312	21.5647	0.0000
Motorcycle	MDV	0.0004	0.0494	0.0000
Total		0.0476	26.5060	-0.0018

Emission Factors (mg/km and mg/start): 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Table 3.2.3, www.ipcc-nggip.iges.or.jp/EFDB/find_ef_main.php

Mobile Emissions - Nitrous Oxide

Year 2030 **Vehicle Miles Traveled** 2,493,661

Prepared by Michael Brandman Associates **Total Trips** 124683 (20 miles/trip)

Edited July 20, 2010

	Pounds/day	Tons/day	Tons/year	MTCO2e/yr
Starting Emissions	32.12	0.0161	5.86	1649
Running Emissions	130.56	0.0653	23.83	6701
Total	162.68	0.0813	29.69	8349

Vehicle Percentages

Vehicle Type	Percent	Non-Catalyst	Catalyst	Diesel
Automobile	20.1	0.6	99.2	0.2
Light duty truck	28.8	1.4	95.9	2.7
Heavy duty trucks and buses	49.2	0.4	99.6	0.0
Motorcycle	1.8	0.9	99.1	0.0

Running Emission Factors (mg/km)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	8	20	1
Light duty truck	9	26	1
Heavy duty trucks and buses	20	55	3
Motorcycle	3	3	3

Running Emission Factors (g/mile)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	0.0050	0.0124	0.0006
Light duty truck	0.0056	0.0162	0.0006
Heavy duty trucks and buses	0.0124	0.0342	0.0019
Motorcycle	0.0019	0.0019	0.0019

Running Emissions (pounds per day)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	0.03	13.62	0.00
Light duty truck	0.12	24.52	0.03
Heavy duty trucks and buses	0.13	91.92	0.00
Motorcycle	0.00	0.19	0.00
Total	0.29	130.24	0.03

Starting Emission Factors (mg/start)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	**28**	72	0
Light duty truck	**9**	26	-1
Heavy duty trucks and buses	**70**	194	-2
Motorcycle	**12**	12	0

Starting Emission Factors (g/start)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	0.028	0.072	0
Light duty truck	0.009	0.026	-0.001
Heavy duty trucks and buses	0.07	0.194	-0.002
Motorcycle	0.012	0.012	0

Trip Distribution

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Automobile	150.7	24907.9	50.2
Light duty truck	503.4	34486.1	970.9
Heavy duty trucks and buses	245.5	61123.1	0.0
Motorcycle	20.5	2262.1	0.0

Starting Emissions (pounds per day)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Automobile	LDA	0.0093	3.9454	0.0000
Light duty truck	LDT1	0.0100	1.9726	-0.0021
Heavy duty trucks and buses	LDT2	0.0378	26.0874	0.0000
Motorcycle	MDV	0.0005	0.0597	0.0000
Total		0.0576	32.0651	-0.0021

Emission Factors (mg/km and mg/start): 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Table 3.2.3, www.ipcc-nggip.iges.or.jp/EFDB/find_ef_main.php

Waste - Year 2009

Prepared by: Michael Brandman Associates

Waste generated in 2008 (tons)	67,474
Population in 2008	87,260
Waste per capita (estimated from 2008)	0.773
Population in 2009	102,896
Waste (tons per year)	**79,565**

EPA Waste Reduction Model (WARM) Inputs

Material	% Generated	Tons Generated
Aluminum Cans	0.1%	79.6
Steel Cans	0.6%	477.4
Copper Wire		0.0
Glass	1.4%	1113.9
HDPE	0.4%	318.3
LDPE		0.0
PET	0.5%	397.8
Corrugated Cardboard	4.8%	3819.1
Magazines/Third-class Mail	0.7%	557.0
Newspaper	1.3%	1034.3
Office Paper		0.0
Phonebooks	0.1%	79.6
Textbooks		0.0
Dimensional Lumber	14.5%	11536.9
Medium-density Fiberboard	1.6%	1273.0
Food Scraps	15.5%	12332.5
Yard Trimmings	2.7%	2148.2
Grass	1.9%	1511.7
Leaves	1.9%	1511.7
Branches	0.6%	477.4
Mixed Paper (general)	8.5%	6763.0
Mixed Paper (primarily residential)		0.0
Mixed Paper (primarily from offices)	1.9%	1511.7
Mixed Metals	4.0%	3182.6
Mixed Plastics	8.7%	6922.1
Mixed Recyclables		0.0
Mixed Organics	4.3%	3421.3
Mixed MSW	18.8%	14958.1
Carpet	3.2%	2546.1
Personal Computers	0.5%	397.8
Clay Bricks		0.0
Concrete	1.2%	954.8
Fly Ash	0.1%	79.6
Tires	0.2%	159.1
Total	100.0%	79,565

- WARM - U.S. Environmental Protection Agency. November 2009. Waste Reduction Model. www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.htm
- Waste generation rate 2008: CalRecycle. Jurisdiction Profile for the City of Hesperia. www.calrecycle.ca.gov/Profiles/Juris/JurProfile2.asp?RG=C&JURID=196&JUR=Hesperia
- Population in 2008: State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2009, with 2000 Benchmark. Sacramento, California, May 2009. www.dof.ca.gov/research/demographic/reports/estimates/e-4_2001-07/
- Percent waste generated: California Integrated Waste Management Board, prepared by Cascadia Consulting Group. August 2009. 2008 California Statewide Waste Characterization Study. (Table 7: Composition of California's Overall Waste Stream) www.calrecycle.ca.gov/Publications/General/2009023.pdf

GHG Emissions Analysis -- Summary Report

Version 10 (10/09)

GHG Emissions Waste Management Analysis for City of Hesperia 2009

Prepared by: Michael Brandman Associates

Project Period for this Analysis: 01/01/09 to 12/31/09

Note: If you wish to save these results, rename this file (e.g., WARM-MN1) and save it. Then the "Analysis Inputs" sheet of the "WARM" file will be blank when you are ready to make another model run.

GHG Emissions from Baseline Waste Management ($MTCO_2E$): 28,394

Commodity	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total $MTCO_2E$
Aluminum Cans	-	79.6	-	NA	3
Steel Cans	-	477.4	-	NA	18
Glass	-	1,113.9	-	NA	43
HDPE	-	318.3	-	NA	12
PET	-	397.8	-	NA	15
Corrugated Cardboard	-	3,819.1	-	NA	1468
Magazines/third-class mail	-	557.0	-	NA	(171)
Newspaper	-	1,034.3	-	NA	(904)
Phonebooks	-	79.6	-	NA	(70)
Dimensional Lumber	-	11,536.9	-	NA	(5719)
Medium Density Fiberboard	-	1,273.0	-	NA	(631)
Food Scraps	NA	12,332.5	-	-	8800
Yard Trimmings	NA	2,148.2	-	-	(393)
Grass	NA	1,511.7	-	-	253
Leaves	NA	1,511.7	-	-	(861)
Branches	NA	477.4	-	-	(237)
Mixed Paper, Broad	-	6,763.0	-	NA	2169
Mixed Paper, Office	-	1,511.7	-	NA	648
Mixed Metals	-	3,182.6	-	NA	122
Mixed Plastics	-	6,922.1	-	NA	266
Mixed Organics	NA	3,421.3	-	-	884
Mixed MSW	NA	14,958.1	-	NA	22519
Carpet	-	2,546.1	-	NA	98
Personal Computers	-	397.8	-	NA	15
Concrete	-	954.8	NA	NA	37
Fly Ash	-	79.6	NA	NA	3
Tires	-	159.1	-	NA	6
					0
					0
					0
					0
					0
					0
					0

GHG Emissions from Alternative Waste Management Scenario ($MTCO_2E$): 28,394

Commodity	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total $MTCO_2E$	Change (Alt - Base) $MTCO_2E$
Aluminum Cans	0.0	0.0	79.6	0.0	NA	3	0
Steel Cans	0.0	0.0	477.4	0.0	NA	18	0
Glass	0.0	0.0	1113.9	0.0	NA	43	0
HDPE	0.0	0.0	318.3	0.0	NA	12	0
PET	0.0	0.0	397.8	0.0	NA	15	0
Corrugated Cardboard	0.0	0.0	3819.1	0.0	NA	1468	0
Magazines/third-class mail	0.0	0.0	557.0	0.0	NA	(171)	0
Newspaper	0.0	0.0	1034.3	0.0	NA	(904)	0
Phonebooks	0.0	0.0	79.6	0.0	NA	(70)	0
Dimensional Lumber	0.0	0.0	11536.9	0.0	NA	(5719)	0
Medium Density Fiberboard	0.0	0.0	1273.0	0.0	NA	(631)	0
Food Scraps	0.0	NA	12332.5	0.0	0.0	8800	0
Yard Trimmings	0.0	NA	2148.2	0.0	0.0	(393)	0
Grass	0.0	NA	1511.7	0.0	0.0	253	0
Leaves	0.0	NA	1511.7	0.0	0.0	(861)	0
Branches	0.0	NA	477.4	0.0	0.0	(237)	0
Mixed Paper, Broad	NA	0.0	6763.0	0.0	NA	2169	0
Mixed Paper, Office	NA	0.0	1511.7	0.0	NA	648	0
Mixed Metals	NA	0.0	3182.6	0.0	NA	122	0
Mixed Plastics	NA	0.0	6922.1	0.0	NA	266	0
Mixed Organics	NA	NA	3421.3	0.0	0.0	884	0
Mixed MSW	NA	NA	14958.1	0.0	NA	22519	0
Carpet	0.0	0.0	2546.1	0.0	NA	98	0
Personal Computers	0.0	0.0	397.8	0.0	NA	15	0
Concrete	NA	0.0	954.8	NA	NA	37	0
Fly Ash	NA	0.0	79.6	NA	NA	3	0
Tires	0.0	0.0	159.1	0.0	NA	6	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0

Total Change in GHG Emissions: - $MTCO_2E$

Note: a negative value (i.e., a value in parentheses) indicates an emission reduction; a positive value indicates an emission increase.

a) For explanation of methodology, see the EPA report:
Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks (EPA530-R-06-004)
-- available on the Internet at http://epa.gov/climatechange/wycd/waste/downloads/fullreport.pdf (5.6 Mb PDF file).
b) Emissions estimates provided by this model are intended to support voluntary GHG measurement and reporting initiatives.

This is equivalent to...

Removing	-	Passenger Cars from the Roadway Each Year
Conserving	-	Gallons of Gasoline
Conserving	-	Cylinders of Propane Used for Home Barbeques
Conserving	-	Railway Cars of Coal

0.00000% Annual CO_2 emissions from the U.S. transportation sector

0.00000% Annual CO_2 emissions from the U.S. electricity sector

Waste - Year 2020

Prepared by: Michael Brandman Associates

Waste generated in 2008 (tons)	67,474
Population in 2008	87,260
Waste per capita (estimated from 2008)	0.773
Population in 2020	176,527
Waste (tons per year)	**136,500**

Alternative Scenario refers to diverting waste to 60%. In 2006, diversion was 53%. Thus, 8% is needed to divert to 60%, which is 10920 tons

EPA Waste Reduction Model (WARM) Inputs

Material	% Generated	Tons Generated
Aluminum Cans	0.1%	136.5
Steel Cans	0.6%	819.0
Copper Wire		0.0
Glass	1.4%	1911.0
HDPE	0.4%	546.0
LDPE		0.0
PET	0.5%	682.5
Corrugated Cardboard	4.8%	6552.0
Magazines/Third-class Mail	0.7%	955.5
Newspaper	1.3%	1774.5
Office Paper		0.0
Phonebooks	0.1%	136.5
Textbooks		0.0
Dimensional Lumber	14.5%	19792.5
Medium-density Fiberboard	1.6%	2184.0
Food Scraps	15.5%	21157.5
Yard Trimmings	2.7%	3685.5
Grass	1.9%	2593.5
Leaves	1.9%	2593.5
Branches	0.6%	819.0
Mixed Paper (general)	8.5%	11602.5
Mixed Paper (primarily residential)		0.0
Mixed Paper (primarily from offices)	1.9%	2593.5
Mixed Metals	4.0%	5460.0
Mixed Plastics	8.7%	11875.5
Mixed Recyclables		0.0
Mixed Organics	4.3%	5869.5
Mixed MSW	18.8%	25662.0
Carpet	3.2%	4368.0
Personal Computers	0.5%	682.5
Clay Bricks		0.0
Concrete	1.2%	1638.0
Fly Ash	0.1%	136.5
Tires	0.2%	273.0
Total	100.0%	136,500

- WARM - U.S. Environmental Protection Agency. November 2009. Waste Reduction Model. www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.htm
- Waste generation rate 2008: CalRecycle. Jurisdiction Profile for the City of Hesperia. www.calrecycle.ca.gov/Profiles/Juris/JurProfile2.asp?RG=C&JURID=196&JUR=Hesperia
- Population in 2008: State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2009, with 2000 Benchmark. Sacramento, California, May 2009. www.dof.ca.gov/research/demographic/reports/estimates/e-4_2001-07/
- Percent waste generated: California Integrated Waste Management Board, prepared by Cascadia Consulting Group. August 2009. 2008 California Statewide Waste Characterization Study. (Table 7: Composition of California's Overall Waste Stream) www.calrecycle.ca.gov/Publications/General/2009023.pdf

GHG Emissions Analysis -- Summary Report

Version 10 (10/09)

GHG Emissions Waste Management Analysis for City of Hesperia 2020

Prepared by: Michael Brandman Associates

Project Period for this Analysis: 01/01/20 to 12/31/20

Note: If you wish to save these results, rename this file (e.g., WARM-MN1) and save it. Then the "Analysis Inputs" sheet of the "WARM" file will be blank when you are ready to make another model run.

GHG Emissions from Baseline Waste Management ($MTCO_2E$): 48,713

Commodity	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total $MTCO_2E$
Aluminum Cans	-	136.5	-	NA	5
Steel Cans	-	819.0	-	NA	31
Glass	-	1,911.0	-	NA	73
HDPE	-	546.0	-	NA	21
PET	-	682.5	-	NA	26
Corrugated Cardboard	-	6,552.0	-	NA	2518
Magazines/third-class mail	-	955.5	-	NA	(294)
Newspaper	-	1,774.5	-	NA	(1550)
Phonebooks	-	136.5	-	NA	(119)
Dimensional Lumber	-	19,792.5	-	NA	(9812)
Medium Density Fiberboard	-	2,184.0	-	NA	(1083)
Food Scraps	NA	21,157.5	-	-	15096
Yard Trimmings	NA	3,685.5	-	-	(674)
Grass	NA	2,593.5	-	-	433
Leaves	NA	2,593.5	-	-	(1478)
Branches	NA	819.0	-	-	(406)
Mixed Paper, Broad	-	11,602.5	-	NA	3721
Mixed Paper, Office	-	2,593.5	-	NA	1113
Mixed Metals	-	5,460.0	-	NA	210
Mixed Plastics	-	11,875.5	-	NA	456
Mixed Organics	NA	5,869.5	-	-	1517
Mixed MSW	NA	25,662.0	-	NA	38634
Carpet	-	4,368.0	-	NA	168
Personal Computers	-	682.5	-	NA	26
Concrete	-	1,638.0	NA	NA	63
Fly Ash	-	136.5	NA	NA	5
Tires	-	273.0	-	NA	10
					0
					0
					0
					0
					0
					0
					0

GHG Emissions from Alternative Waste Management Scenario ($MTCO_2E$): 30,243

Commodity	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total $MTCO_2E$	Change (Alt - Base) $MTCO_2E$
Aluminum Cans	0.0	0.0	136.5	0.0	NA	5	0
Steel Cans	0.0	0.0	819.0	0.0	NA	31	0
Glass	0.0	382.2	1528.8	0.0	NA	(48)	(121)
HDPE	0.0	109.2	436.8	0.0	NA	(136)	(157)
PET	0.0	136.5	546.0	0.0	NA	(191)	(217)
Corrugated Cardboard	0.0	1310.4	5241.6	0.0	NA	(2052)	(4570)
Magazines/third-class mail	0.0	191.1	764.4	0.0	NA	(822)	(528)
Newspaper	0.0	354.9	1419.6	0.0	NA	(2233)	(682)
Phonebooks	0.0	13.7	122.9	0.0	NA	(144)	(24)
Dimensional Lumber	0.0	1979.3	17813.3	0.0	NA	(13691)	(3879)
Medium Density Fiberboard	0.0	0.0	2184.0	0.0	NA	(1083)	0
Food Scraps	0.0	NA	17983.9	0.0	3173.6	12203	(2893)
Yard Trimmings	0.0	NA	2948.4	0.0	737.1	(685)	(11)
Grass	0.0	NA	2074.8	0.0	518.7	244	(189)
Leaves	0.0	NA	2074.8	0.0	518.7	(1285)	193
Branches	0.0	NA	655.2	0.0	163.8	(357)	49
Mixed Paper, Broad	NA	1160.3	10442.3	0.0	NA	(719)	(4440)
Mixed Paper, Office	NA	259.4	2334.2	0.0	NA	115	(998)
Mixed Metals	NA	0.0	5460.0	0.0	NA	210	0
Mixed Plastics	NA	0.0	11875.5	0.0	NA	456	0
Mixed Organics	NA	NA	5869.5	0.0	0.0	1517	0
Mixed MSW	NA	NA	25662.0	0.0	NA	38634	0
Carpet	0.0	0.0	4368.0	0.0	NA	168	0
Personal Computers	0.0	0.0	682.5	0.0	NA	26	0
Concrete	NA	0.0	1638.0	NA	NA	63	0
Fly Ash	NA	0.0	136.5	NA	NA	5	0
Tires	0.0	0.0	273.0	0.0	NA	10	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0

Total Change in GHG Emissions: (18,470) $MTCO_2E$

Note: a negative value (i.e., a value in parentheses) indicates an emission reduction; a positive value indicates an emission increase.

a) For explanation of methodology, see the EPA report:
Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks (EPA530-R-06-004)
-- available on the Internet at http://epa.gov/climatechange/wycd/waste/downloads/fullreport.pdf (5.6 Mb PDF file).
b) Emissions estimates provided by this model are intended to support voluntary GHG measurement and reporting initiatives.

This is equivalent to...

Removing	**3,383**	Passenger Cars from the Roadway Each Year
Conserving	**2,096,457**	Gallons of Gasoline
Conserving	**7,695,743**	Cylinders of Propane Used for Home Barbeques
Conserving	**96**	Railway Cars of Coal
	0.00098%	Annual CO_2 emissions from the U.S. transportation sector
	0.00077%	Annual CO_2 emissions from the U.S. electricity sector

Waste - Year 2030

Prepared by: Michael Brandman Associates

Waste generated in 2008 (tons)	67,474
Population in 2008	87,260
Waste per capita (estimated from 2008)	0.773
Population in 2030	243,465
Waste (tons per year)	**188,260**

EPA Waste Reduction Model (WARM) Inputs

Material	% Generated	Tons Generated
Aluminum Cans	0.1%	188.3
Steel Cans	0.6%	1129.6
Copper Wire		0.0
Glass	1.4%	2635.6
HDPE	0.4%	753.0
LDPE		0.0
PET	0.5%	941.3
Corrugated Cardboard	4.8%	9036.5
Magazines/Third-class Mail	0.7%	1317.8
Newspaper	1.3%	2447.4
Office Paper		0.0
Phonebooks	0.1%	188.3
Textbooks		0.0
Dimensional Lumber	14.5%	27297.7
Medium-density Fiberboard	1.6%	3012.2
Food Scraps	15.5%	29180.3
Yard Trimmings	2.7%	5083.0
Grass	1.9%	3576.9
Leaves	1.9%	3576.9
Branches	0.6%	1129.6
Mixed Paper (general)	8.5%	16002.1
Mixed Paper (primarily residential)		0.0
Mixed Paper (primarily from offices)	1.9%	3576.9
Mixed Metals	4.0%	7530.4
Mixed Plastics	8.7%	16378.6
Mixed Recyclables		0.0
Mixed Organics	4.3%	8095.2
Mixed MSW	18.8%	35392.9
Carpet	3.2%	6024.3
Personal Computers	0.5%	941.3
Clay Bricks		0.0
Concrete	1.2%	2259.1
Fly Ash	0.1%	188.3
Tires	0.2%	376.5
Total	100.0%	188,260

- WARM - U.S. Environmental Protection Agency. November 2009. Waste Reduction Model. www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.htm
- Waste generation rate 2008: CalRecycle. Jurisdiction Profile for the City of Hesperia. www.calrecycle.ca.gov/Profiles/Juris/JurProfile2.asp?RG=C&JURID=196&JUR=Hesperia
- Population in 2008: State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2009, with 2000 Benchmark. Sacramento, California, May 2009. www.dof.ca.gov/research/demographic/reports/estimates/e-4_2001-07/
- Percent waste generated: California Integrated Waste Management Board, prepared by Cascadia Consulting Group. August 2009. 2008 California Statewide Waste Characterization Study. (Table 7: Composition of California's Overall Waste Stream) www.calrecycle.ca.gov/Publications/General/2009023.pdf

GHG Emissions Analysis -- Summary Report

Version 10 (10/09)

GHG Emissions Waste Management Analysis for City of Hesperia 2030

Prepared by: Michael Brandman Associates

Project Period for this Analysis: 01/01/30 to 12/31/30

Note: If you wish to save these results, rename this file (e.g., WARM-MN1) and save it. Then the "Analysis Inputs" sheet of the "WARM" file will be blank when you are ready to make another model run.

GHG Emissions from Baseline Waste Management ($MTCO_2E$): 67,184

Commodity	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total $MTCO_2E$
Aluminum Cans	-	188.3	-	NA	7
Steel Cans	-	1,129.6	-	NA	43
Glass	-	2,635.6	-	NA	101
HDPE	-	753.0	-	NA	29
PET	-	941.3	-	NA	36
Corrugated Cardboard	-	9,036.5	-	NA	3473
Magazines/third-class mail	-	1,317.8	-	NA	(405)
Newspaper	-	2,447.4	-	NA	(2138)
Phonebooks	-	188.3	-	NA	(164)
Dimensional Lumber	-	27,297.7	-	NA	(13532)
Medium Density Fiberboard	-	3,012.2	-	NA	(1493)
Food Scraps	NA	29,180.3	-	-	20821
Yard Trimmings	NA	5,083.0	-	-	(929)
Grass	NA	3,576.9	-	-	598
Leaves	NA	3,576.9	-	-	(2038)
Branches	NA	1,129.6	-	-	(560)
Mixed Paper, Broad	-	16,002.1	-	NA	5132
Mixed Paper, Office	-	3,576.9	-	NA	1534
Mixed Metals	-	7,530.4	-	NA	289
Mixed Plastics	-	16,378.6	-	NA	629
Mixed Organics	NA	8,095.2	-	-	2093
Mixed MSW	NA	35,392.9	-	NA	53284
Carpet	-	6,024.3	-	NA	231
Personal Computers	-	941.3	-	NA	36
Concrete	-	2,259.1	NA	NA	87
Fly Ash	-	188.3	NA	NA	7
Tires	-	376.5	-	NA	14
					0
					0
					0
					0
					0
					0
					0

GHG Emissions from Alternative Waste Management Scenario ($MTCO_2E$): 41,711

Commodity	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total $MTCO_2E$	Change (Alt - Base) $MTCO_2E$
Aluminum Cans	0.0	0.0	188.3	0.0	NA	7	0
Steel Cans	0.0	0.0	1129.6	0.0	NA	43	0
Glass	0.0	527.1	2108.5	0.0	NA	(66)	(167)
HDPE	0.0	150.6	602.4	0.0	NA	(188)	(217)
PET	0.0	188.3	753.0	0.0	NA	(263)	(299)
Corrugated Cardboard	0.0	1807.3	7229.2	0.0	NA	(2830)	(6304)
Magazines/third-class mail	0.0	263.6	1054.2	0.0	NA	(1133)	(728)
Newspaper	0.0	489.5	1957.9	0.0	NA	(3079)	(941)
Phonebooks	0.0	18.8	169.5	0.0	NA	(198)	(34)
Dimensional Lumber	0.0	2729.8	24567.9	0.0	NA	(18882)	(5350)
Medium Density Fiberboard	0.0	0.0	3012.2	0.0	NA	(1493)	0
Food Scraps	0.0	NA	24803.3	0.0	4377.0	16830	(3990)
Yard Trimmings	0.0	NA	4066.4	0.0	1016.6	(945)	(16)
Grass	0.0	NA	2861.5	0.0	715.4	336	(261)
Leaves	0.0	NA	2861.5	0.0	715.4	(1772)	266
Branches	0.0	NA	903.7	0.0	225.9	(493)	67
Mixed Paper, Broad	NA	1600.2	14401.9	0.0	NA	(992)	(6123)
Mixed Paper, Office	NA	357.7	3219.2	0.0	NA	158	(1376)
Mixed Metals	NA	0.0	7530.4	0.0	NA	289	0
Mixed Plastics	NA	0.0	16378.6	0.0	NA	629	0
Mixed Organics	NA	NA	8095.2	0.0	0.0	2093	0
Mixed MSW	NA	NA	35392.9	0.0	NA	53284	0
Carpet	0.0	0.0	6024.3	0.0	NA	231	0
Personal Computers	0.0	0.0	941.3	0.0	NA	36	0
Concrete	NA	0.0	2259.1	NA	NA	87	0
Fly Ash	NA	0.0	188.3	NA	NA	7	0
Tires	0.0	0.0	376.5	0.0	NA	14	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0

Total Change in GHG Emissions: (25,473) $MTCO_2E$

Note: a negative value (i.e., a value in parentheses) indicates an emission reduction; a positive value indicates an emission increase.

a) For explanation of methodology, see the EPA report:
Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks (EPA530-R-06-004)
-- available on the Internet at http://epa.gov/climatechange/wycd/waste/downloads/fullreport.pdf (5.6 Mb PDF file).
b) Emissions estimates provided by this model are intended to support voluntary GHG measurement and reporting initiatives.

This is equivalent to...

Removing	**4,666**	Passenger Cars from the Roadway Each Year
Conserving	**2,891,419**	Gallons of Gasoline
Conserving	**10,613,917**	Cylinders of Propane Used for Home Barbeques
Conserving	**133**	Railway Cars of Coal
	0.00135%	Annual CO_2 emissions from the U.S. transportation sector
	0.00106%	Annual CO_2 emissions from the U.S. electricity sector

Appendix B: Southern California Edison Reports

Electricity Use Report
For City of Hesperia
Year 2007

Prepared by

Southern California Edison

Version 5.0

April 26th, 2010

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

I. Introduction

The purpose of this report is to fulfill your request for overall energy consumption data for the City of Hesperia. SCE has made every effort to fulfill this request. However, our legal responsibility of maintaining confidentiality of individual customer data limits us to providing only the following information:

- Rate group descriptions
- kWh consumption, and
- kW demand for those rate groups with demand meters (non-coincident and coincident loads); no kW demand data is available for those rate groups that do not have demand metered data

II. Energy and Demand Data Availability

Rate group specific energy consumption data is readily available and included within this report. However, several of our rate schedules such as Schedule "D," the standard domestic rate, do not require the measurement of demand data. Therefore, coincident demand-related data within this report is only an estimate reflecting those rate groups where demand is measured. Table A summarizes the availability of demand data by rate group:

Table A – Data Availability Table

Rate Groups ***with*** Demand Data	Rate Groups ***without*** Demand Data
GS-2, PA-2, TOU-PA-5, AG TOU, TOU-GS-3, and TOU-8	Domestic, GS-1, PA1, TC-1 and Street Lighting

For rate groups ***with*** measured demand data, we have provided:

- Total kWh
- Non-coincident peak demand - this is the sum of the individual accounts' maximum peak demands, regardless of when they occur
- Coincident peak demand – this is a calculated field based on application of the coincidence factors outlined on page 3, section III
- Number of accounts

For rate groups ***without*** measured demand data, we have provided:

- Total kWh
- Number of accounts

III. Coincidence Factors

Coincidence factor is an indication of how closely the individual customer peaks conform to the time of the rate group peak. Coincidence factor is expressed as a proportion and can never be greater than 1.0. Table B lists coincidence factors based SCE system wide peak demands.

Table C on page 4 contains calculated values of coincident peak demand. To derive these values, the rate class non-coincident peak (Table C) is multiplied by its respective rate class coincidence factor, in Table B, yielding a calculated "Coincident Peak (kW)". The calculated coincident peaks approximate the maximum peak for each rate class.

Table B - System Coincidence Factors

	Coincidence Factor				Coincidence Factor		
Rate Group	Annual	Summer	Winter	Rate Group	Annual	Summer	Winter
Domestic-Single	0.38	0.42	0.30	GS-1	0.46	0.52	0.41
Domestic-Multiple	0.26	0.32	0.24	TC-1	1.00	1.00	1.00
Domestic- Mstr Mtrd	0.61	0.66	0.56	GS-2	0.71	0.74	0.70
				TOU-GS	0.53	0.54	0.58
Total Domestic	0.34	0.39	0.28	Total Sm and Med	0.61	0.65	0.60

	Coincidence Factor				Coincidence Factor		
Rate Group	Annual	Summer	Winter	Rate Group	Annual	Summer	Winter
PA-1	0.40	0.44	0.34	TOU-8-Secondry	0.76	0.79	0.76
PA-2	0.65	0.70	0.63	TOU-8-Primary	0.70	0.74	0.70
AGTOU	0.62	0.67	0.54	TOU-8-Sub	0.67	0.71	0.68
Tou-PA-5	0.84	0.84	0.86				
Total AG&Pump	0.46	0.50	0.40	Total Large Power	0.70	0.74	0.71

IV. Data Description

The summaries provided in Tables C, are based on 12 months usage data ending December, 2007 for SCE installed service accounts within the city's boundaries. The accounts included in the dataset were extracted from SCE's Customer Service System based on the Public Authority Code for the City of Hesperia. This code is used to identify accounts by municipality for the purpose of calculating state and local taxes. Public Authority Code is permanently retained as a part of each premise's identification regardless of occupancy. The only time a Public Authority Code changes is when a city or county annexes a given piece of property into its territory or a particular piece of property is transferred from one public authority to another through other means.

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V. Summary of Results (January 1, 2007 – December 31, 2007)

Table C – Total of Account Summary Data for Bundled and Direct Access Customers

RATE GROUP	ANNUAL KWH	% of TOTAL	NONCOINCIDENT PEAK	CALCULATED COINCIDENT PEAK	NUMBER OF ACCOUNTS	% OF TOTAL
AG TOU	28,203,637	7.8%	6,182	3,833	42	0.1%
DOMESTIC	211,472,892	58.6%	-	-	27,626	89.9%
GS-1	24,971,913	6.9%	-	-	2,296	7.5%
GS-2	60,725,631	16.8%	20,814	14,778	486	1.6%
STREET LIGHTING	6,048,440	1.7%	-	-	248	0.8%
TOU-GS	29,226,347	8.1%	10,763	5,704	29	0.1%

Grand Total	360,648,860	30,727

DA % of kWh	2.2%

Application of 15/15 Rule (Section VIII. Release of Aggregated Customer Information, p. 6)
The PA-1, PA-2 and TOU-PA-5 rate groups were combined into the AG TOU rate group.
The TOU-8 rate group is combined into the TOU-GS rate group.

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VI. Additional Data Availability

The data listed in Tables C are at a summary level, and are not displayed by time-of-use. For your convenience we have attached time-of-use load profiles (Appendix A) for each rate class. In the event that you would like the detailed data that supports these load profiles (annual hourly load data for each rate class average profile), you can find it on SCE's website at the following address:

http://www.sce.com/AboutSCE/Regulatory/loadprofiles/

Additionally, revenue impacts are often part of an overall economic analysis related to energy consumption. In the event that you would like specific rate schedules, you can find them at the following web address:

http://www.sce.com/AboutSCE/Regulatory/tariffbooks/ratespricing/

VII. Public Goods Charge Energy Efficiency Funds

SCE estimated the City of Hesperia's proportional share of Public Goods Charge (PGC) funded energy efficiency activities that the California Public Utilities Commission might make available to the customers in the City of Hesperia if it became a community choice aggregator ("CCA") but did not implement energy efficiency programs in the CCA territory. SCE performed the estimated proportional share calculation in accordance with the directives of Decision (D.) 03-07-034 of the California Public Utilities Commission, and determined that the City of Hesperia's estimated proportional share is $ 588,529. Please note that the estimated proportional share calculation does not necessarily represent an amount of funds that would be made available for energy efficiency programs in the City of Hesperia's territory should the City of Hesperia become a CCA. As stated in D.03-07-034, the proportional share calculation is only used to estimate non-CCA expenditures in a CCA's territory. Also note that the proportional share estimate is not equal to the amount of PGC funds collected from ratepayers in the City of Hesperia, since the PGC rate includes authorized amounts for energy efficiency as well as other public interest programs.

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VIII. Release of Aggregated Customer Information

The 15/15 Rule is intended to protect customer confidentiality by reducing the possibility of identifying customers through the release of usage information. SCE will apply the 15/15 Rule in releasing aggregated customer information. The rule was initially implemented by the California Public Utilities Commission during Direct Access proceedings in 1997 and was adopted through D. 97-10-031.

The 15/15 rule requires that any aggregated information provided by the Utilities must be made up of at least 15 customers, and a customer's load must be less than 15% of an assigned category. If the number of customers in the compiled data is below 15, or if a single customer's load is more than 15% of the total data, categories (e.g., rate classes) must be combined before the information is released. The rule further requires that if the 15/15 rule is triggered for a second tie after the data has been screened once already using the 15/15 rule, then the customer is dropped from the information provided.

IX. Disclaimer

Southern California Edison Company has provided the above information at your request. The data presented here represents 12 months ending December, 2007. These estimates are provided for informational purposes only, and are not intended to, nor do they, predict what energy usage and loads within your city boundaries will be in the future. The actual future loads and energy consumption will vary from these estimates for a variety of reasons, including changes in energy usage, demand levels, and weather patterns. Southern California Edison Company assumes no liability for the use of the information provided above. If you have any questions regarding this information, please contact your Southern California Edison Company Account Representative.

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Appendix A

Rate Class Average Load Profiles

SOUTHERN CALIFORNIA EDISON®
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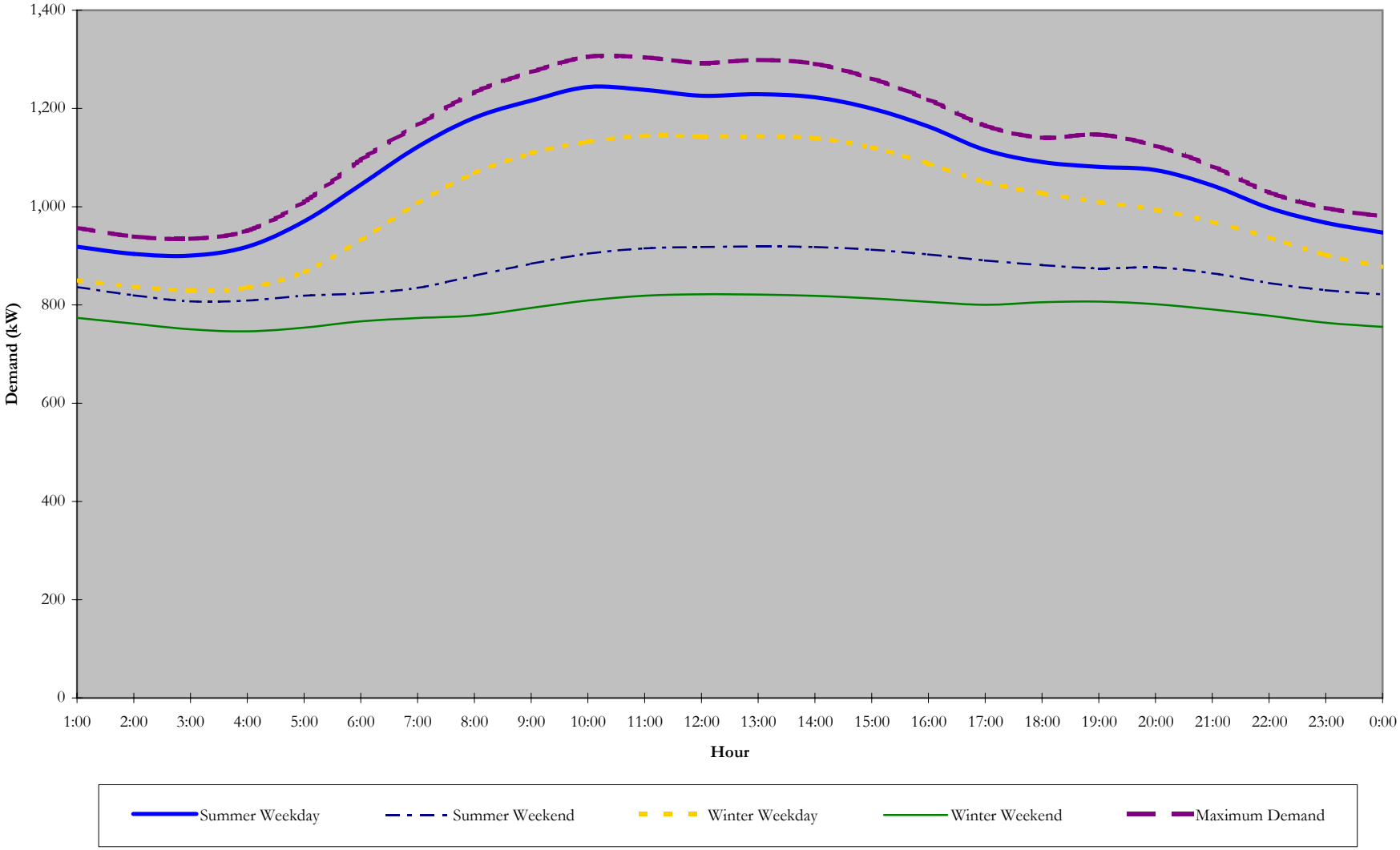
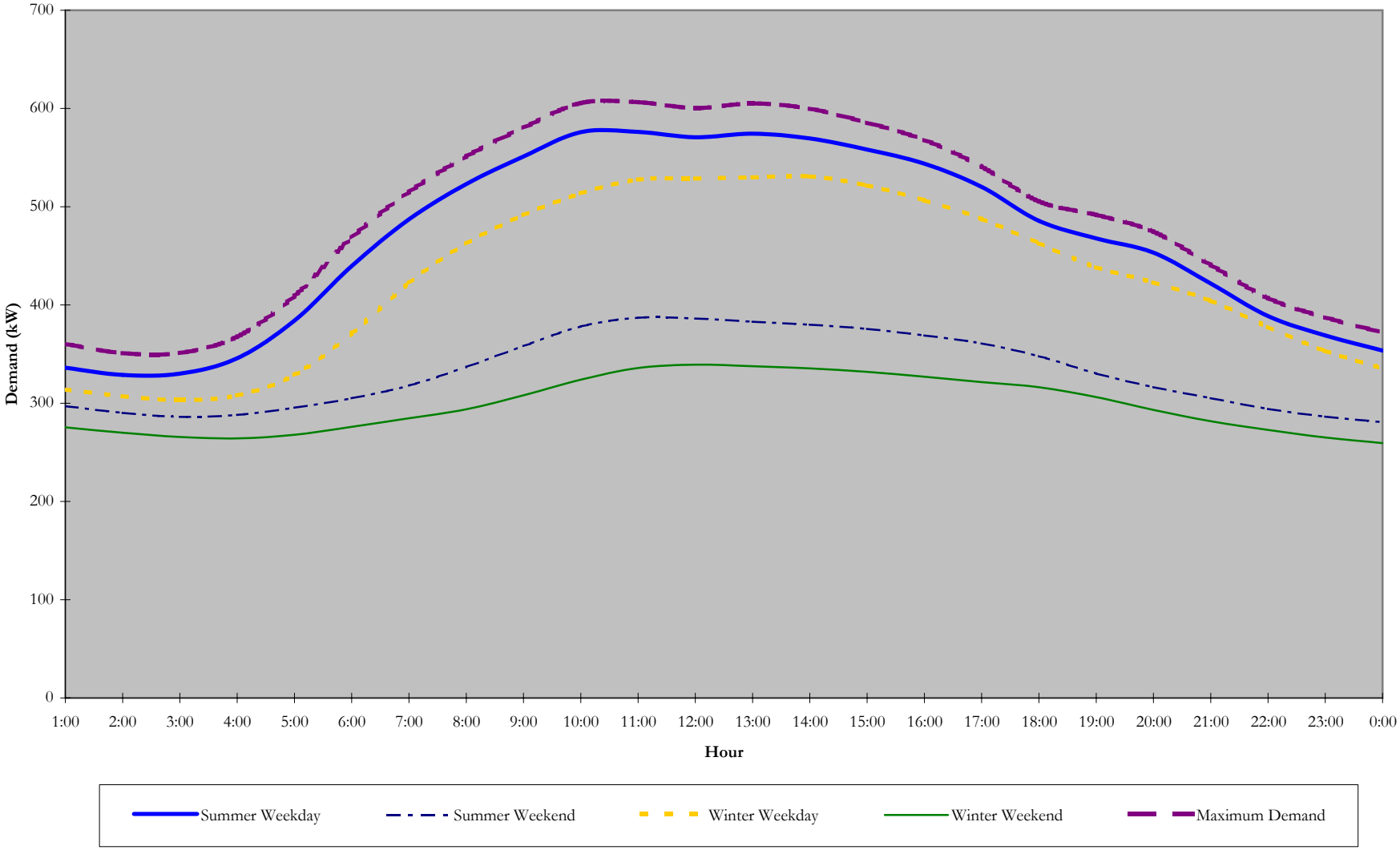
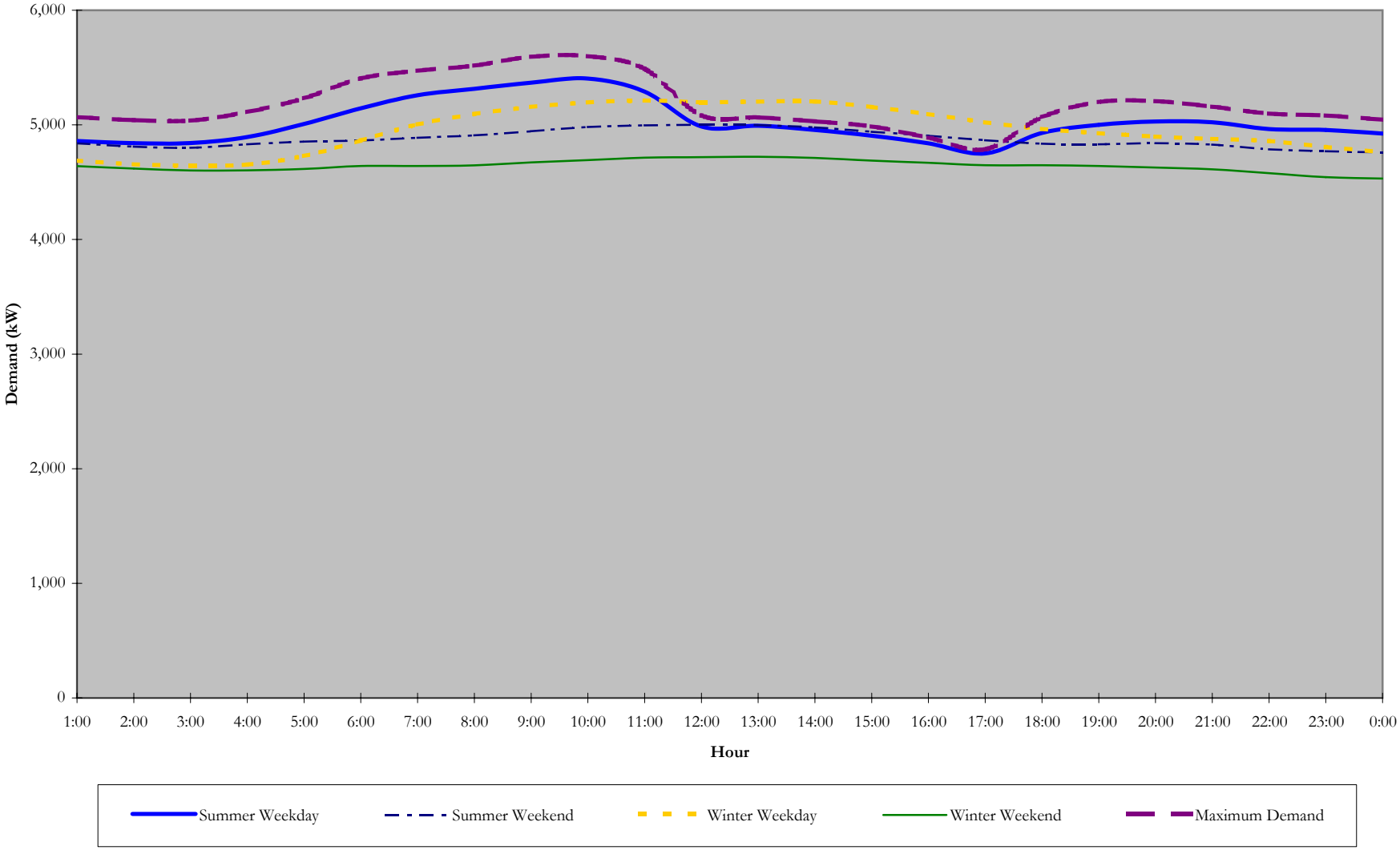
Rate Class Average Load Profiles
TOU-Primary Rate Schedule



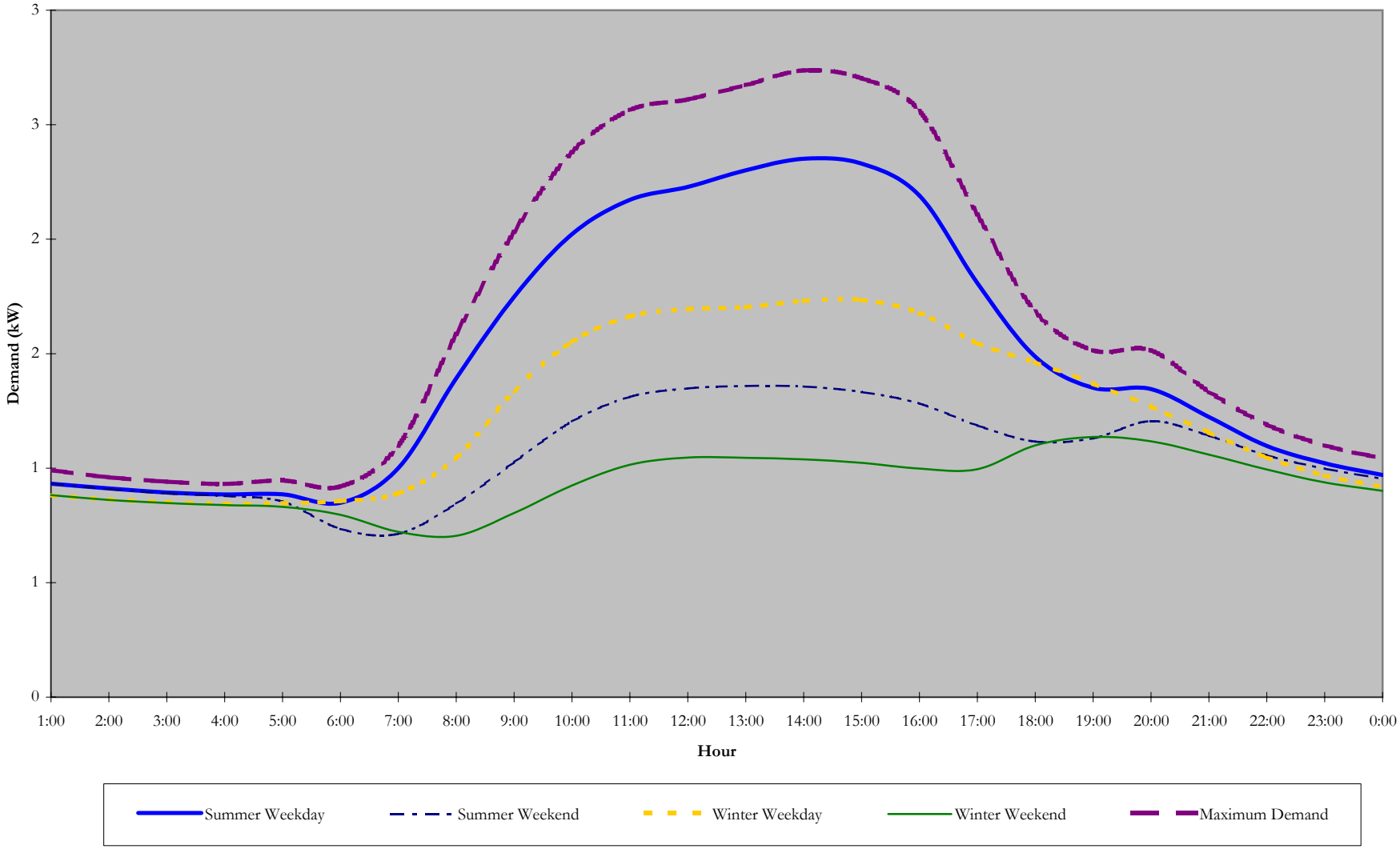
Rate Class Average Load Profiles
TOU-Secondary Rate Schedule



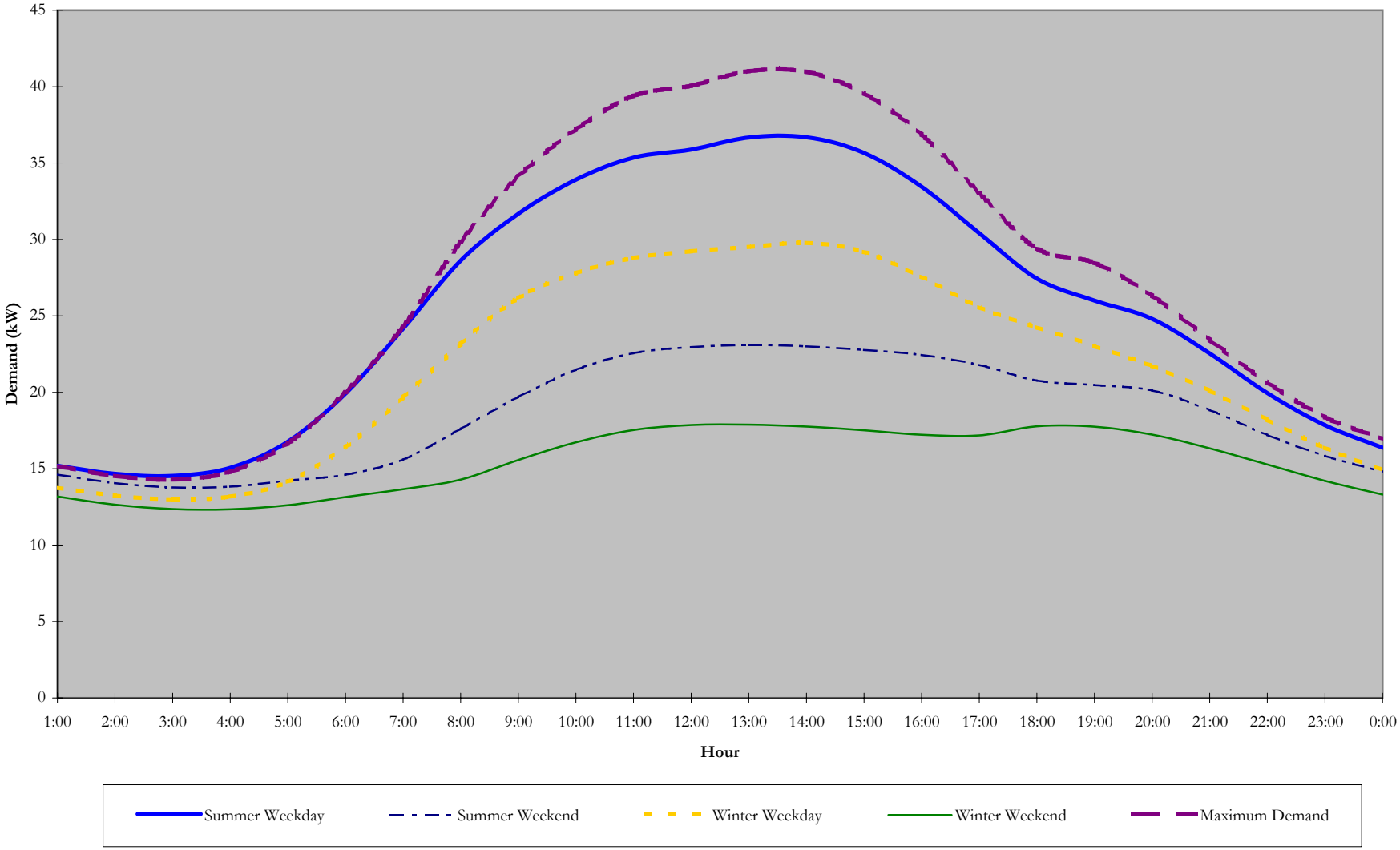
Rate Class Average Load Profiles
TOU-Subtransmission Rate Schedule



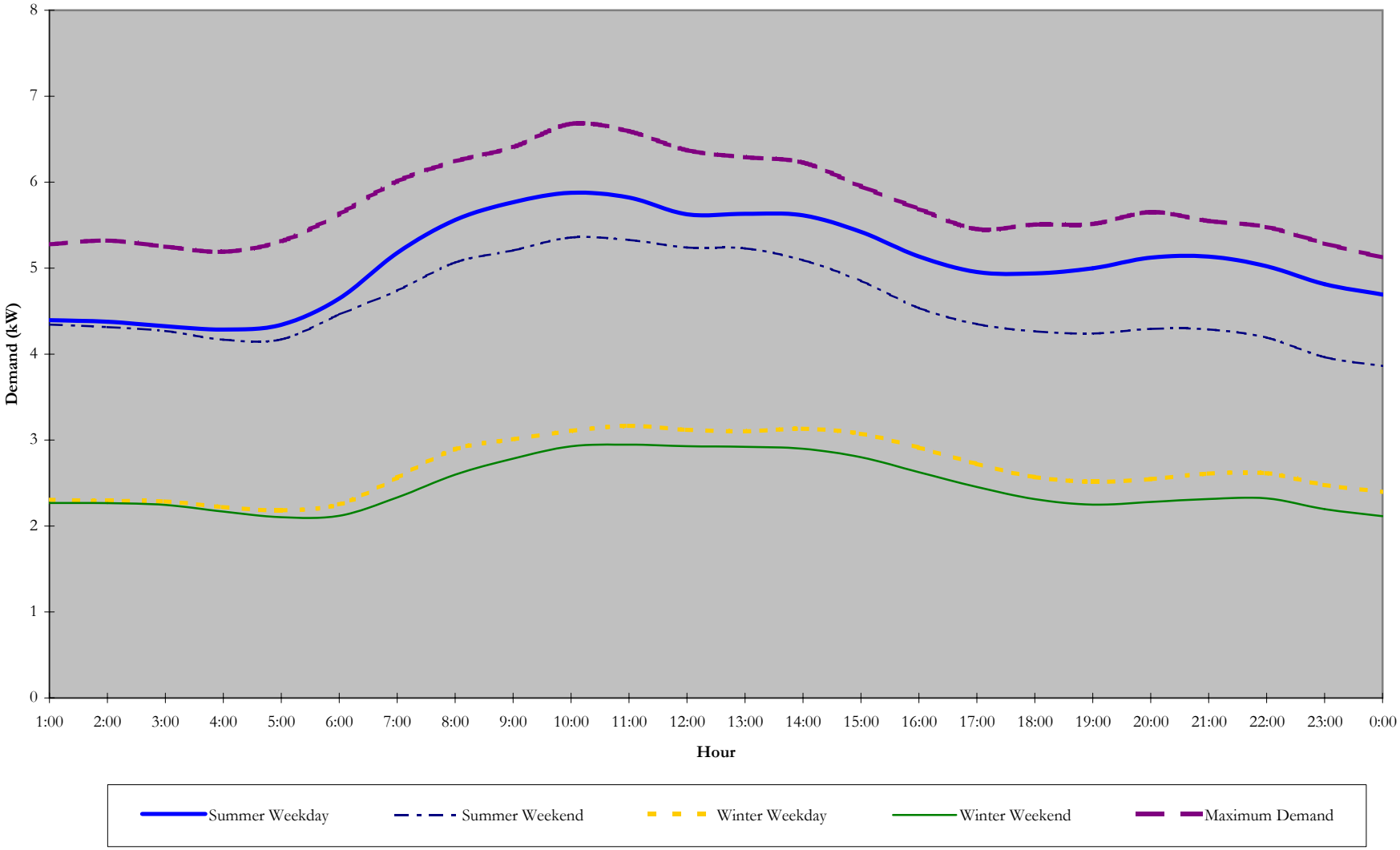
Rate Class Average Load Profile
GS-1 Rate Schedule



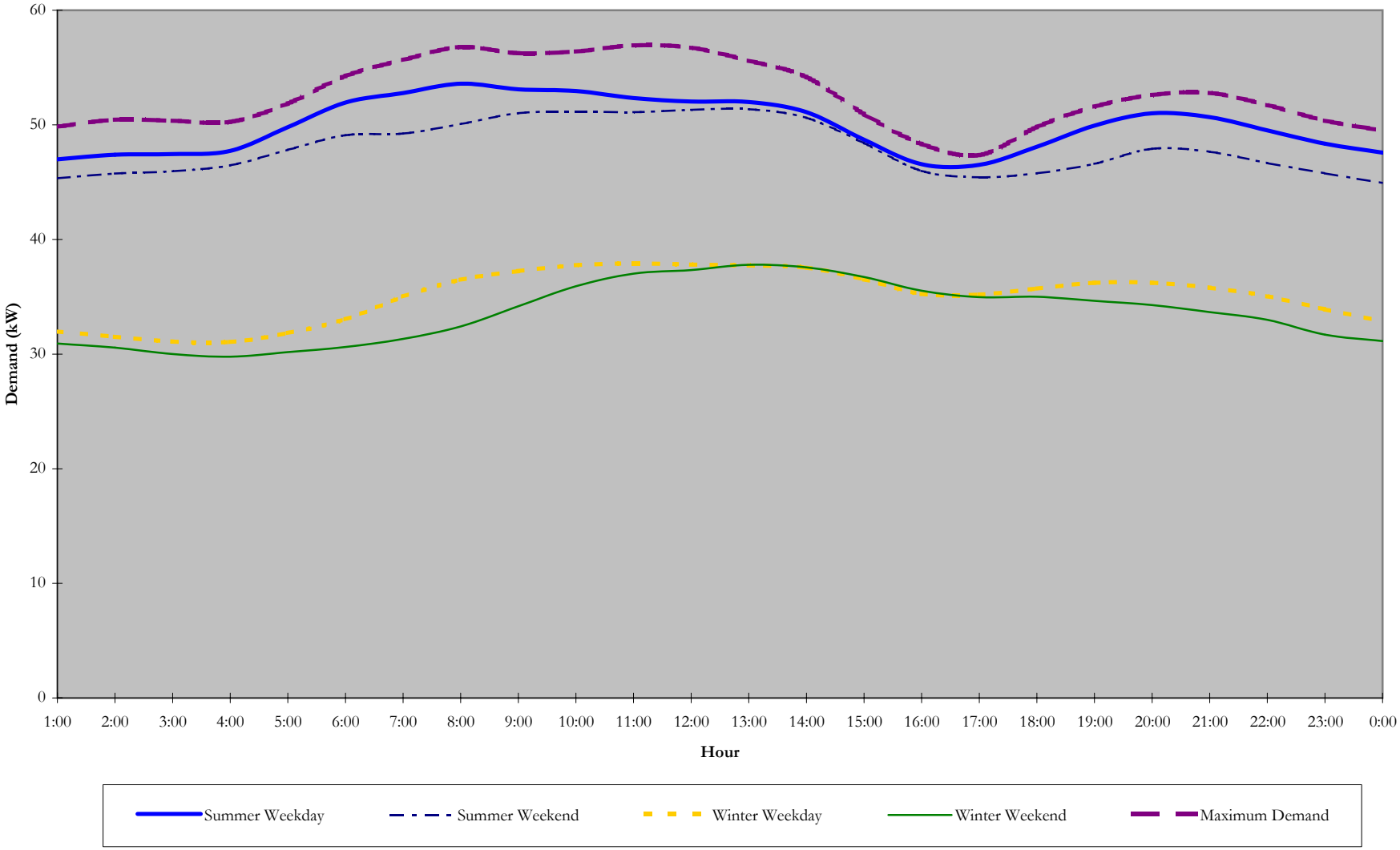
Rate Class Average Load Profiles
GS-2 Rate Schedule



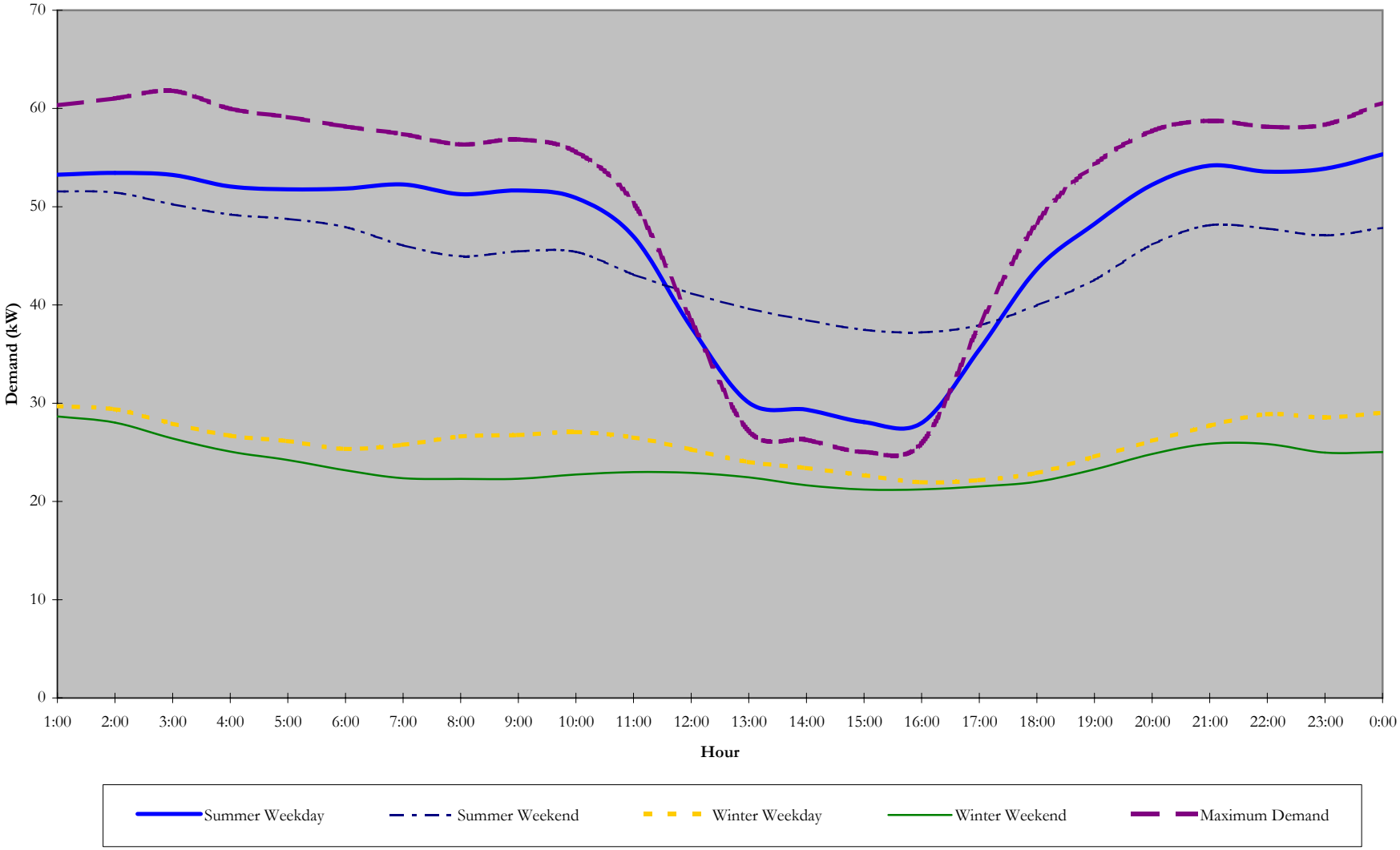
Rate Class Average Load Profiles
PA-1 Rate Schedule



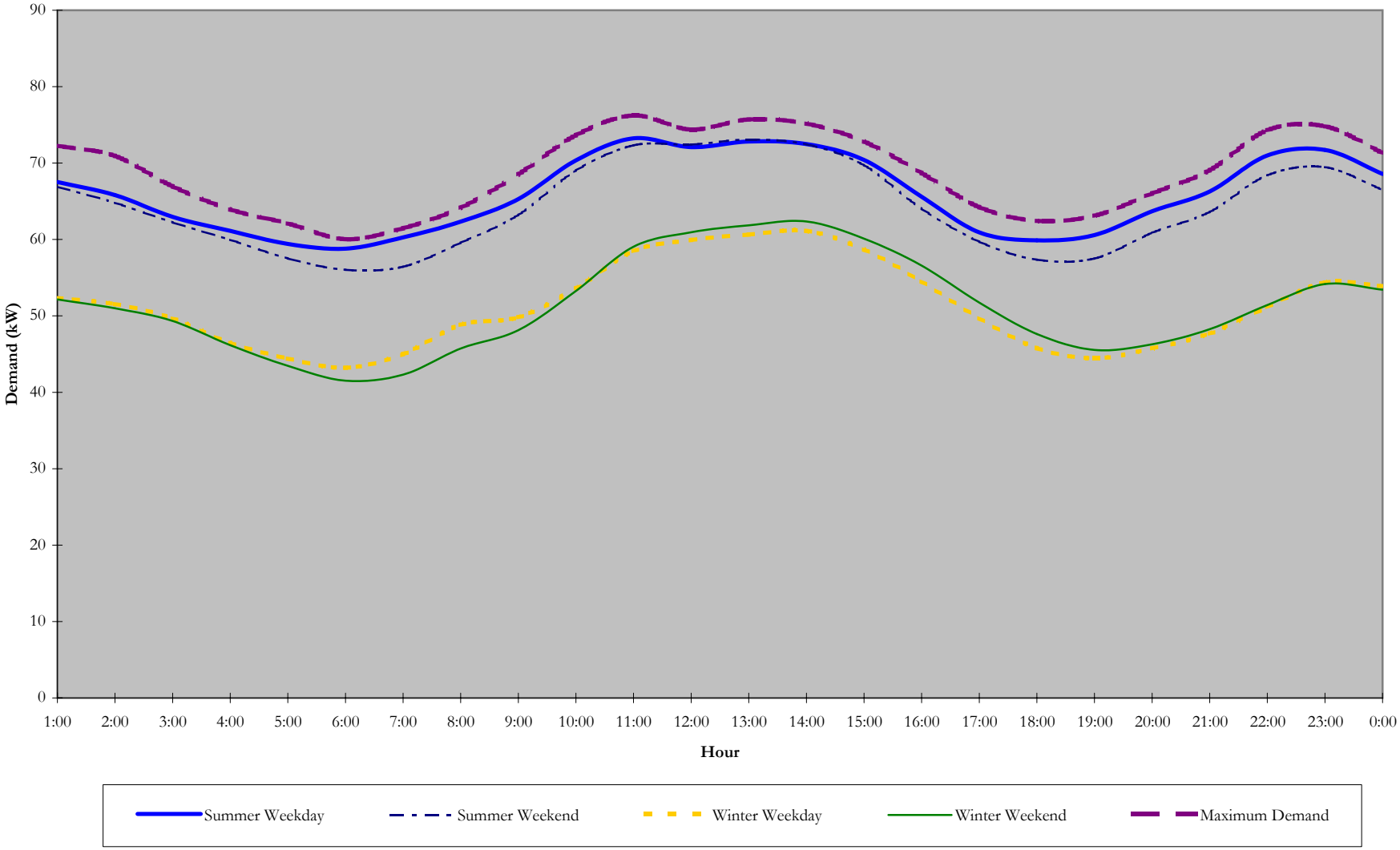
Rate Class Average Load Profiles
PA-2 Rate Schedule



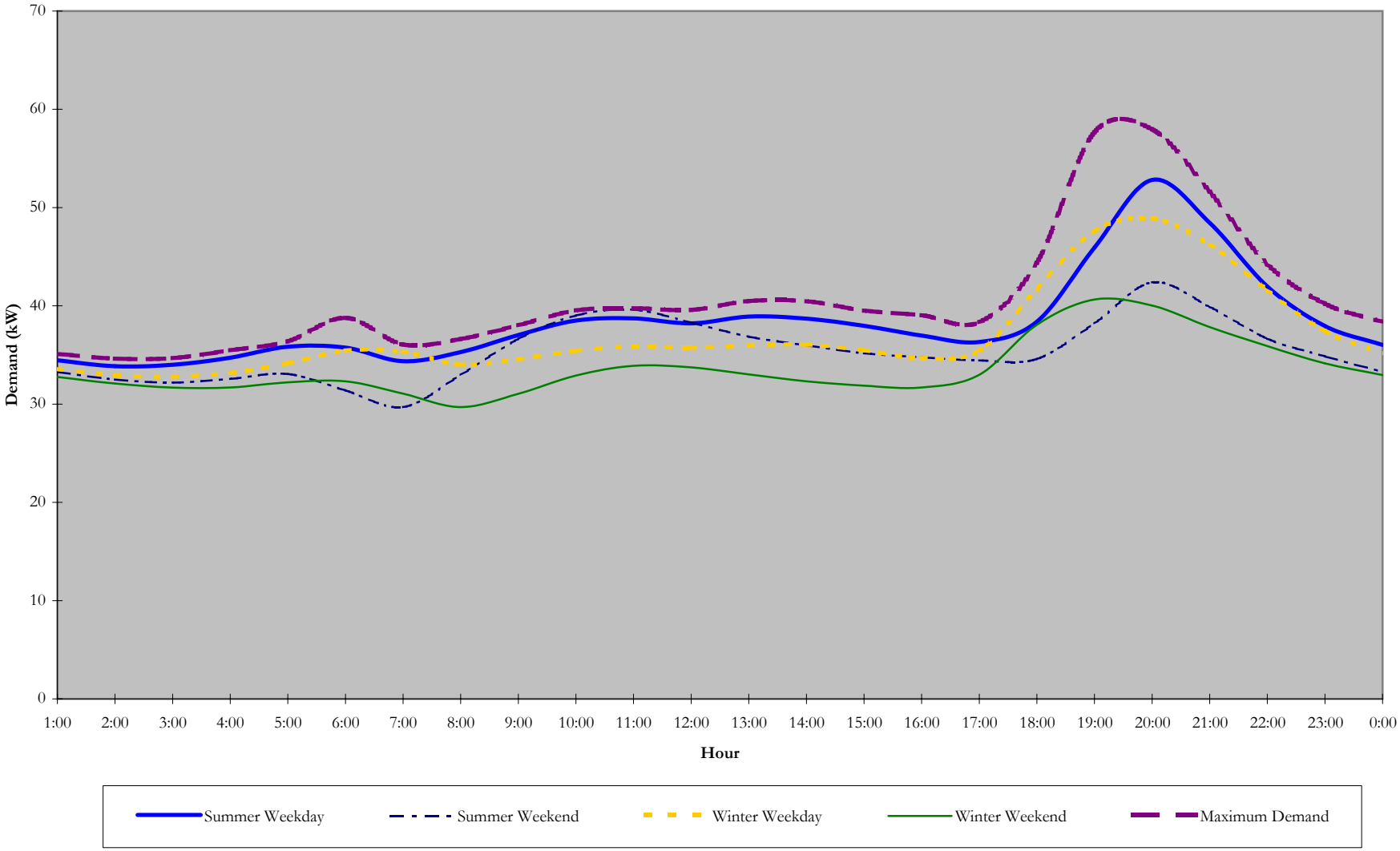
Rate Class Average Load Profiles
AG-TOU Rate Schedule



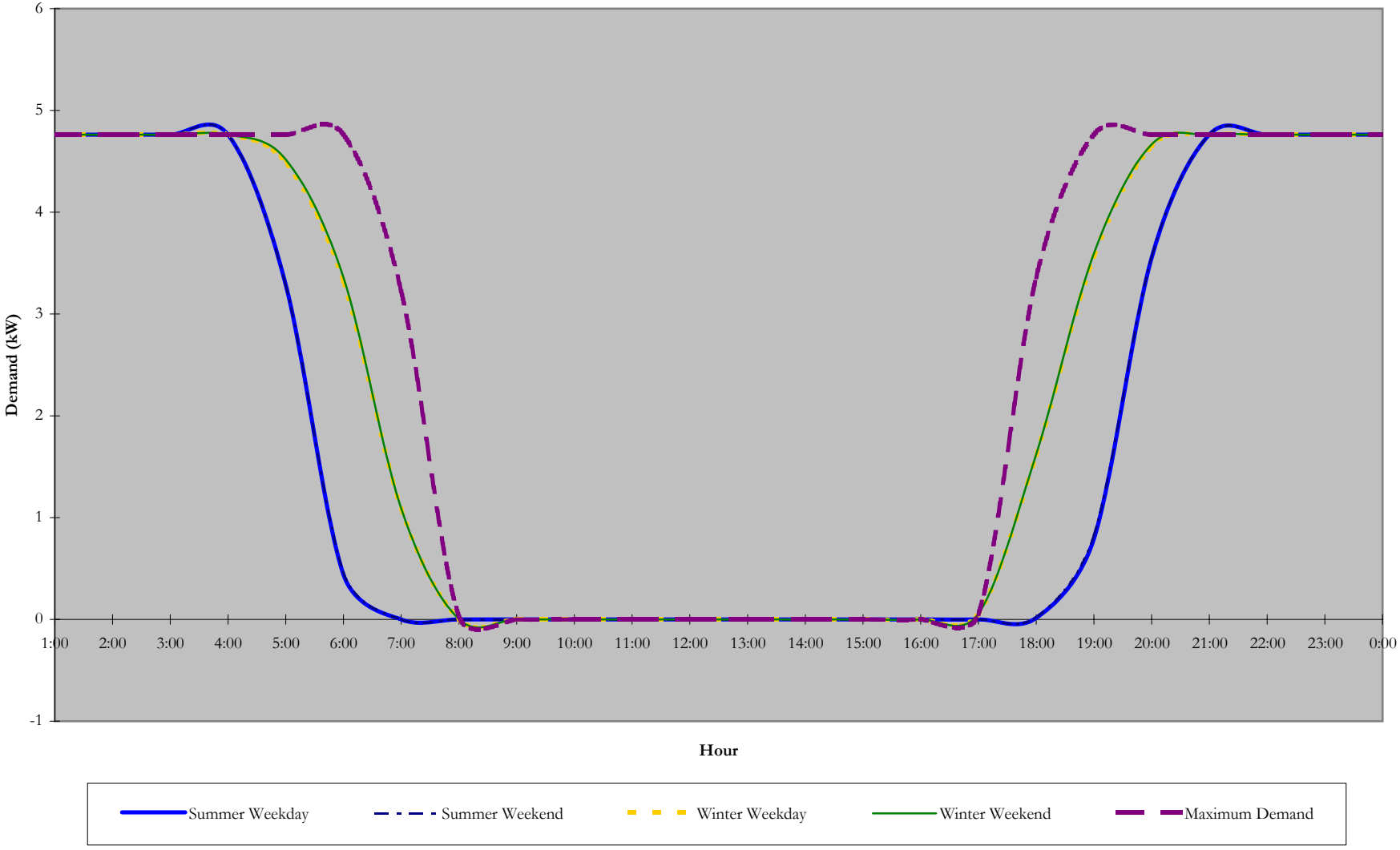
Rate Class Average Load Profiles
TOU-PA-5 Rate Schedule



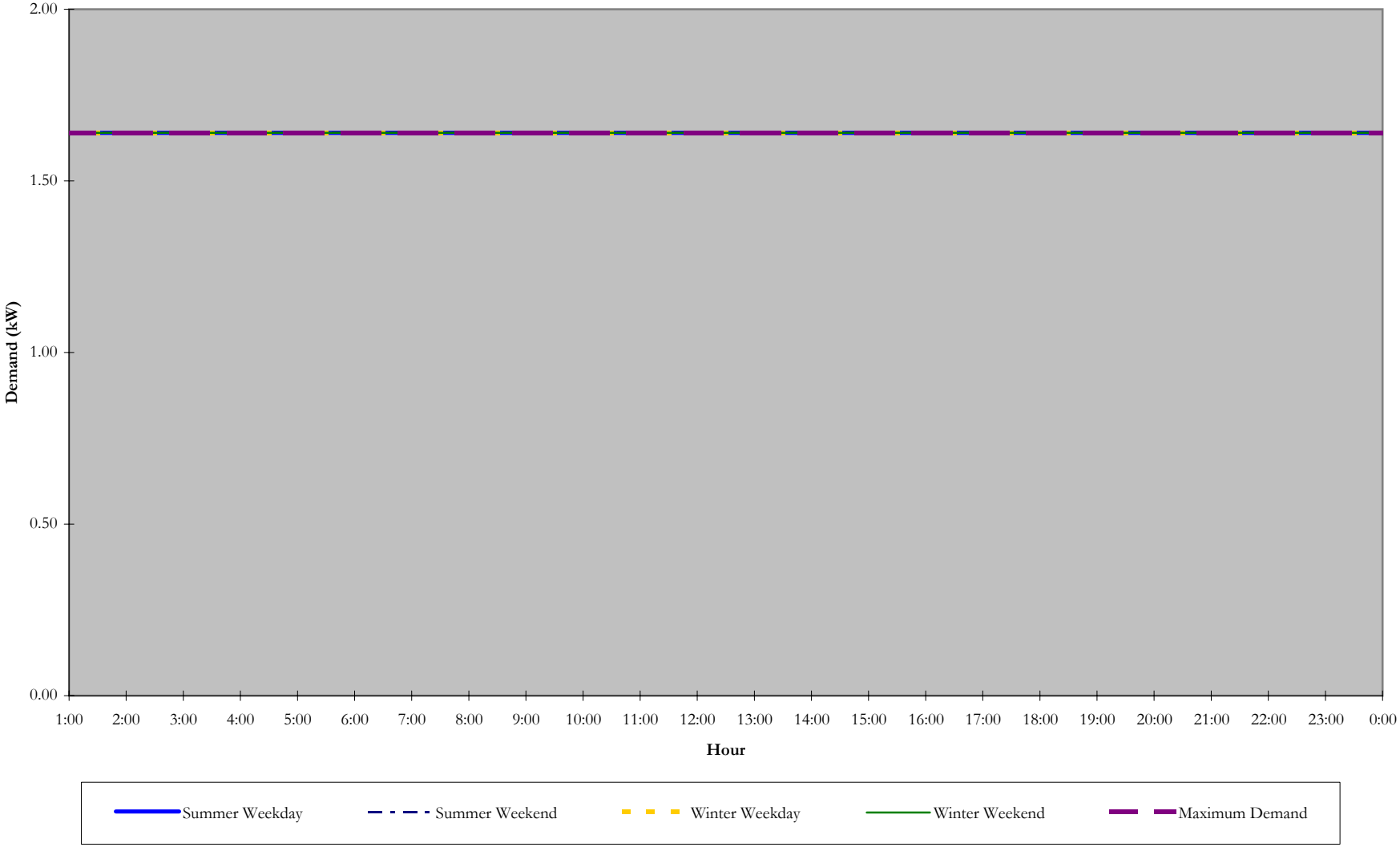
Rate Class Average Load Profiles
TOU-GS Rate Schedule



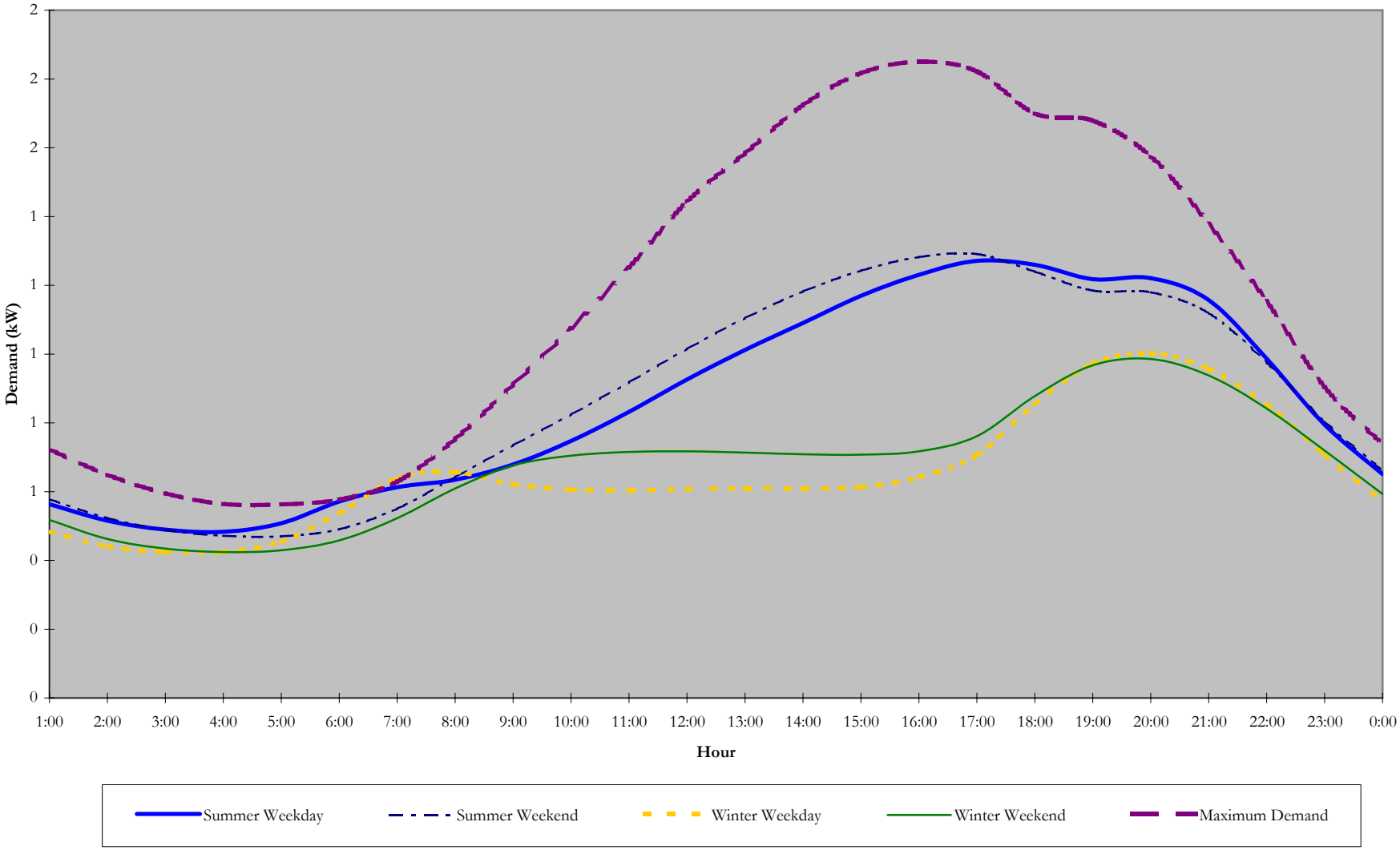
Rate Class Average Load Profiles
Street Light Rate Schedules



Rate Class Average Load Profiles
TC-1 Rate Schedule



Rate Class Average Load Profile
Domestic Rate Schedule



Appendix B

Description of Rate Groups

Domestic (Domestic Service)
For all residential service including lighting, heating, cooking, and power or combination thereof in a single-family accommodation; also to domestic farm service when supplied through the farm operator's domestic meter.

GS-1 (General Service Non-Demand)
Includes single- and three-phase general service including lighting and power, except that the customer whose monthly maximum demand, in the opinion of SCE, is expected to exceed 20 kW or has exceeded 20 kW in any three months during the preceding 12 months.

GS-2 (General Service - Demand)
Includes single- and three-phase general service including lighting and power customers whose monthly maximum demand registers, or in the opinion of SCE is expected to register, above 20 kW and below 200 kW. The customer whose monthly maximum demand, in the opinion of SCE, is expected to exceed 200 kW or has exceeded 200 kW for any three months during the preceding 12 months is ineligible for service under this Schedule. Customers that exceed the 200 kW will be placed in TOU-GS rate class.

TOU-GS (Time-Of-Use - General Service - Demand Metered)
Includes single- and three-phase general service including lighting and power customers whose monthly maximum demand registers, or in the opinion of SCE is expected to register, above 200 kW through 500 kW. The customers whose monthly Maximum Demand, in the opinion of SCE, is expected to exceed 500 kW or has exceeded 500 kW for any three months during the preceding 12 months is ineligible for service under this Schedule.

TOU-8 (Time-Of-Use - General Service – Large)
Includes general service, lighting and power, except agricultural water pumping accounts. This Schedule is mandatory for all customers whose monthly maximum demand, in the opinion of SCE, is expected to exceed 500 kW or has exceeded 500 kW in any three months during the preceding 12 months.

PA-1 (Power - Agricultural and Pumping Connected Load Basis)
Includes accounts where SCE determines that 70% or more of the customer's electrical usage is for general agricultural purposes or for general water or sewerage pumping and none of any remaining electrical usage is for purposes for which a domestic schedule is applicable.

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PA-2 (Power - Agricultural and Pumping Demand Metered)
Includes accounts where SCE determines that 70% or more of the customer's electrical usage is for general agricultural purposes or for general water or sewerage pumping and none of any remaining electrical usage is for purposes for which a domestic schedule is applicable. The Customer whose monthly Maximum Demand, in the opinion of SCE, is expected to, or has reached, 200 kW or above in any three months during the preceding 12 months shall have a Real Time Energy Meter (RTEM) or other type of interval meter installed and shall become ineligible for service under this Schedule. Upon such ineligibility a customer whose Maximum Demand is 500 kW or below shall be transferred to an applicable agricultural Time-of Use (TOU) rate schedule, while a customer whose Maximum Demand exceeds 500 kW will be transferred to Schedule TOU-8. However, in accordance with Schedule TOU-8, a large individual water agency or other large water pumping account with 70% or more of the water pumped used for agricultural purposes, must take service on a TOU agricultural class rate schedule.

TOU-PA-5 (Time-Of-Use Agricultural and Pumping - Demand Metered)
Includes accounts where SCE determines that: 70% or more of the customer's electrical usage is for general agricultural purposes or for general water or sewerage pumping or for oil pumping by customers with a Standard Industrial Classification (SIC) Code of 1311; none of any remaining electrical usage is for purposes for which a domestic schedule is applicable; and, the customer's account has 35 horsepower or more of total connected load or 35 kilowatts or more of Maximum Demand

AG TOU (Time-Of-Use Agricultural and Pumping - Demand Metered)
Includes accounts where SCE determines that: 70% or more of the customer's electrical usage is for water pumping used for agricultural purposes, except where the customer's monthly Maximum Demand, is expected to exceed 500 kW or has exceeded 500 kW for any three months during the preceding 12 months. These accounts are time-of-use agricultural and pumping accounts that do not qualify for the TOU-PA-5 tariff.

TC-1 (Traffic Control Service)
Includes single- and three-phase service: for traffic directional signs or traffic signal systems located on streets, highways and other public thoroughfares and to railway crossing and track signals; for public thoroughfare lighting that is utilized 24 hours per day or is not controlled by switching equipment, such as tunnel or underpass lighting; and, to public authorities for the illumination of bus stop shelters located in the dedicated road right-of-way where such service is combined with other traffic control service as defined above.

STREET LIGHTING (Lighting - Street and Highway Company-Owned System)
Includes service for the lighting of streets, highways, and publicly-owned and publicly-operated automobile parking lots which are open to the general public where SCE owns and maintains the street lighting equipment and associated facilities included under this schedule.

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Electricity Use Report
For Hesperia
Year 2009

Prepared by

Southern California Edison

Version 5.0

April 26th, 2010

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I. Introduction

The purpose of this report is to fulfill your request for overall energy consumption data for the Hesperia. SCE has made every effort to fulfill this request. However, our legal responsibility of maintaining confidentiality of individual customer data limits us to providing only the following information:

- Rate group descriptions
- kWh consumption, and
- kW demand for those rate groups with demand meters (non-coincident and coincident loads); no kW demand data is available for those rate groups that do not have demand metered data

II. Energy and Demand Data Availability

Rate group specific energy consumption data is readily available and included within this report. However, several of our rate schedules such as Schedule "D," the standard domestic rate, do not require the measurement of demand data. Therefore, coincident demand-related data within this report is only an estimate reflecting those rate groups where demand is measured. Table A summarizes the availability of demand data by rate group:

Table A – Data Availability Table

Rate Groups ***with*** Demand Data	Rate Groups ***without*** Demand Data
GS-2, PA-2, TOU-PA-5, AG TOU, TOU-GS-3, and TOU-8	Domestic, GS-1, PA1, TC-1 and Street Lighting

For rate groups ***with*** measured demand data, we have provided:

- Total kWh
- Non-coincident peak demand - this is the sum of the individual accounts' maximum peak demands, regardless of when they occur
- Coincident peak demand – this is a calculated field based on application of the coincidence factors outlined on page 3, section III
- Number of accounts

For rate groups ***without*** measured demand data, we have provided:

- Total kWh
- Number of accounts

III. Coincidence Factors

Coincidence factor is an indication of how closely the individual customer peaks conform to the time of the rate group peak. Coincidence factor is expressed as a proportion and can never be greater than 1.0. Table B lists coincidence factors based SCE system wide peak demands.

Table C on page 4 contains calculated values of coincident peak demand. To derive these values, the rate class non-coincident peak (Table C) is multiplied by its respective rate class coincidence factor, in Table B, yielding a calculated "Coincident Peak (kW)". The calculated coincident peaks approximate the maximum peak for each rate class.

Table B - System Coincidence Factors

	Coincidence Factor				Coincidence Factor		
Rate Group	Annual	Summer	Winter	Rate Group	Annual	Summer	Winter
Domestic-Single	0.38	0.42	0.30	GS-1	0.46	0.52	0.41
Domestic-Multiple	0.26	0.32	0.24	TC-1	1.00	1.00	1.00
Domestic- Mstr Mtrd	0.61	0.66	0.56	GS-2	0.71	0.74	0.70
				TOU-GS	0.53	0.54	0.58
Total Domestic	0.34	0.39	0.28	Total Sm and Med	0.61	0.65	0.60

	Coincidence Factor				Coincidence Factor		
Rate Group	Annual	Summer	Winter	Rate Group	Annual	Summer	Winter
PA-1	0.40	0.44	0.34	TOU-8-Secondry	0.76	0.79	0.76
PA-2	0.65	0.70	0.63	TOU-8-Primary	0.70	0.74	0.70
AGTOU	0.62	0.67	0.54	TOU-8-Sub	0.67	0.71	0.68
Tou-PA-5	0.84	0.84	0.86				
Total AG&Pump	0.46	0.50	0.40	Total Large Power	0.70	0.74	0.71

IV. Data Description

The summaries provided in Tables C, are based on 12 months usage data ending December, 2009 for SCE installed service accounts within the city's boundaries. The accounts included in the dataset were extracted from SCE's Customer Service System based on the Public Authority Code for the Hesperia. This code is used to identify accounts by municipality for the purpose of calculating state and local taxes. Public Authority Code is permanently retained as a part of each premise's identification regardless of occupancy. The only time a Public Authority Code changes is when a city or county annexes a given piece of property into its territory or a particular piece of property is transferred from one public authority to another through other means.

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V. Summary of Results (January 1, 2009 – December 31, 2009)

Table C – Total of Account Summary Data for Bundled and Direct Access Customers

RATE GROUP	ANNUAL KWH	% of TOTAL	NONCOINCIDENT PEAK	CALCULATED COINCIDENT PEAK	NUMBER OF ACCOUNTS	% OF TOTAL
AG TOU	25,431,749	7.2%	8,105	5,025	44	0.1%
DOMESTIC	205,309,988	58.2%	-	-	28,254	90.0%
GS-1	23,633,195	6.7%	-	-	2,277	7.3%
GS-2	58,163,740	16.5%	19,796	14,055	526	1.7%
STREET LIGHTING	6,510,808	1.8%	-	-	247	0.8%
TOU-GS	33,810,940	9.6%	11,753	6,229	34	0.1%

Grand Total	352,860,420		31,382

DA % of kWh	2.1%

Application of 15/15 Rule (Section VIII. Release of Aggregated Customer Information, p. 6)
The PA-1, PA-2 and TOU-PA-5 rate groups were combined into the AG TOU rate group.
The TOU-8 rate group is combined into the TOU-GS rate group.

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VI. Additional Data Availability

The data listed in Tables C are at a summary level, and are not displayed by time-of-use. For your convenience we have attached time-of-use load profiles (Appendix A) for each rate class. In the event that you would like the detailed data that supports these load profiles (annual hourly load data for each rate class average profile), you can find it on SCE's website at the following address:

http://www.sce.com/AboutSCE/Regulatory/loadprofiles/

Additionally, revenue impacts are often part of an overall economic analysis related to energy consumption. In the event that you would like specific rate schedules, you can find them at the following web address:

http://www.sce.com/AboutSCE/Regulatory/tariffbooks/ratespricing/

VII. Public Goods Charge Energy Efficiency Funds

SCE estimated the Hesperia' proportional share of Public Goods Charge (PGC) funded energy efficiency activities that the California Public Utilities Commission might make available to the customers in the Hesperia if it became a community choice aggregator ("CCA") but did not implement energy efficiency programs in the CCA territory. SCE performed the estimated proportional share calculation in accordance with the directives of Decision (D.) 03-07-034 of the California Public Utilities Commission, and determined that the Hesperia' estimated proportional share is $ 588,529. Please note that the estimated proportional share calculation does not necessarily represent an amount of funds that would be made available for energy efficiency programs in the Hesperia' territory should the Hesperia become a CCA. As stated in D.03-07-034, the proportional share calculation is only used to estimate non-CCA expenditures in a CCA's territory. Also note that the proportional share estimate is not equal to the amount of PGC funds collected from ratepayers in the Hesperia, since the PGC rate includes authorized amounts for energy efficiency as well as other public interest programs.

VIII. Release of Aggregated Customer Information

The 15/15 Rule is intended to protect customer confidentiality by reducing the possibility of identifying customers through the release of usage information. SCE will apply the 15/15 Rule in releasing aggregated customer information. The rule was initially implemented by the California Public Utilities Commission during Direct Access proceedings in 1997 and was adopted through D. 97-10-031.

The 15/15 rule requires that any aggregated information provided by the Utilities must be made up of at least 15 customers, and a customer's load must be less than 15% of an assigned category. If the number of customers in the compiled data is below 15, or if a single customer's load is more than 15% of the total data, categories (e.g., rate classes) must be combined before the information is released. The rule further requires that if the 15/15 rule is triggered for a second tie after the data has been screened once already using the 15/15 rule, then the customer is dropped from the information provided.

IX. Disclaimer

Southern California Edison Company has provided the above information at your request. The data presented here represents 12 months ending December, 2009. These estimates are provided for informational purposes only, and are not intended to, nor do they, predict what energy usage and loads within your city boundaries will be in the future. The actual future loads and energy consumption will vary from these estimates for a variety of reasons, including changes in energy usage, demand levels, and weather patterns. Southern California Edison Company assumes no liability for the use of the information provided above. If you have any questions regarding this information, please contact your Southern California Edison Company Account Representative.

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Appendix A

Rate Class Average Load Profiles

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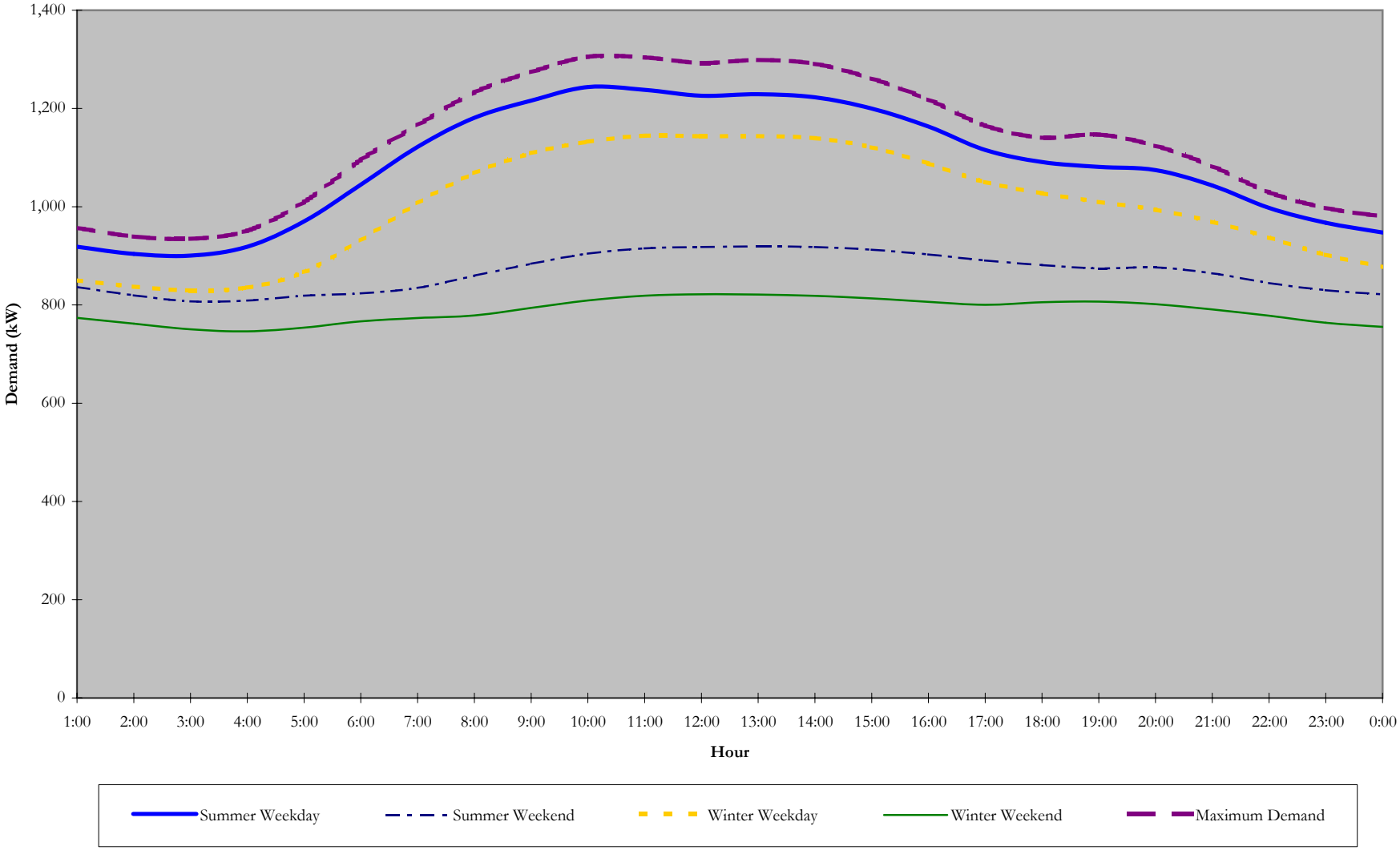
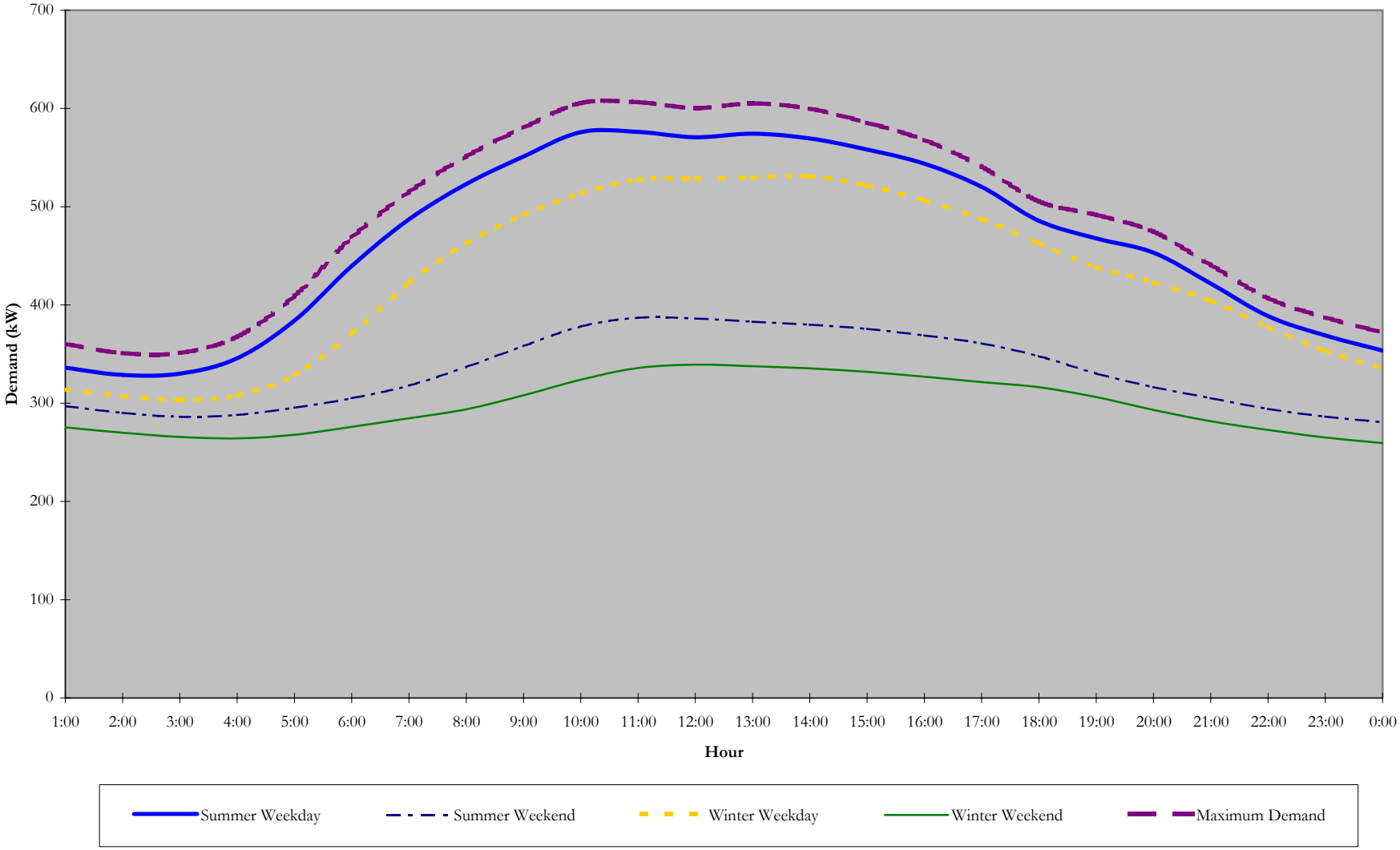
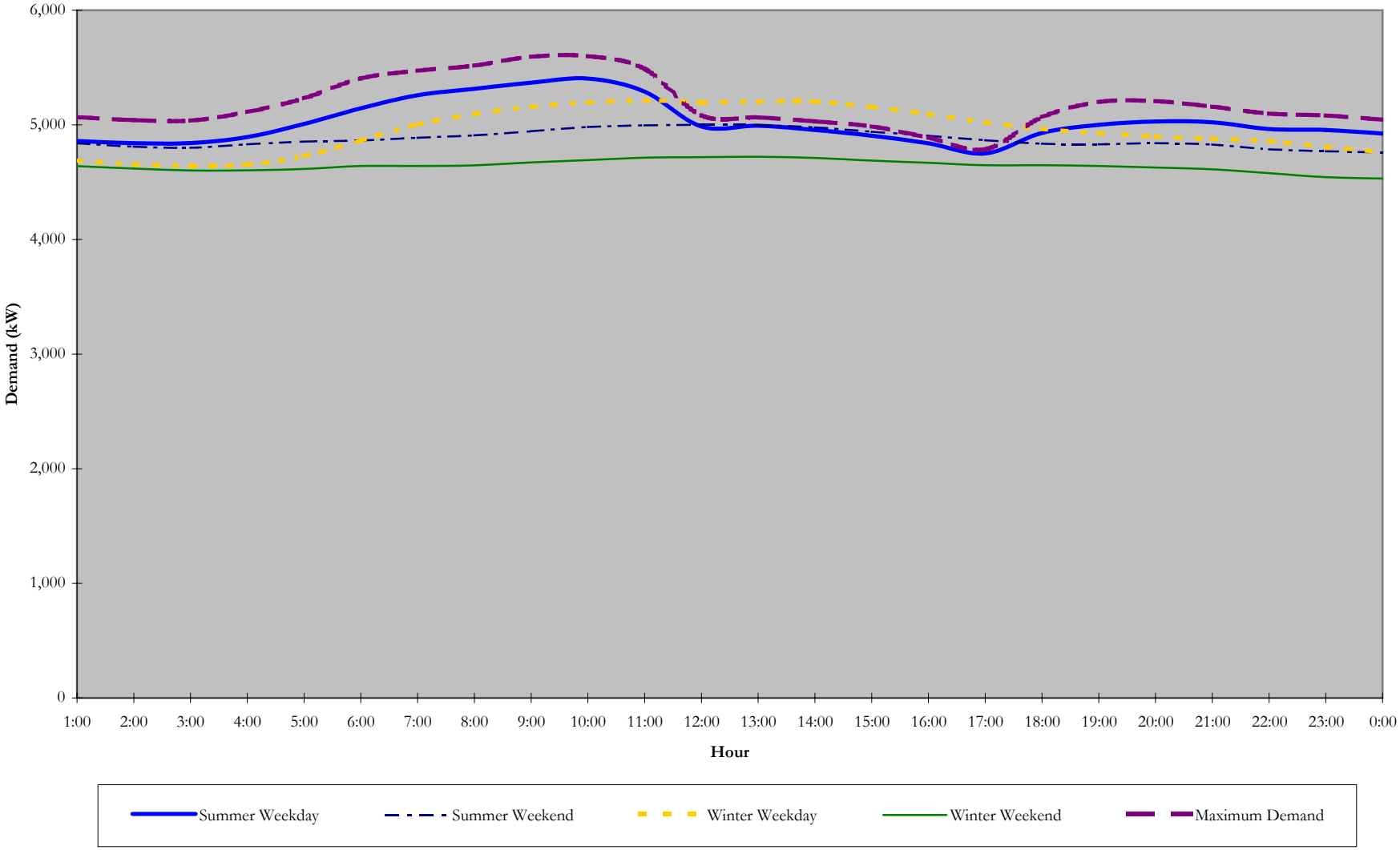
Rate Class Average Load Profiles
TOU-Primary Rate Schedule



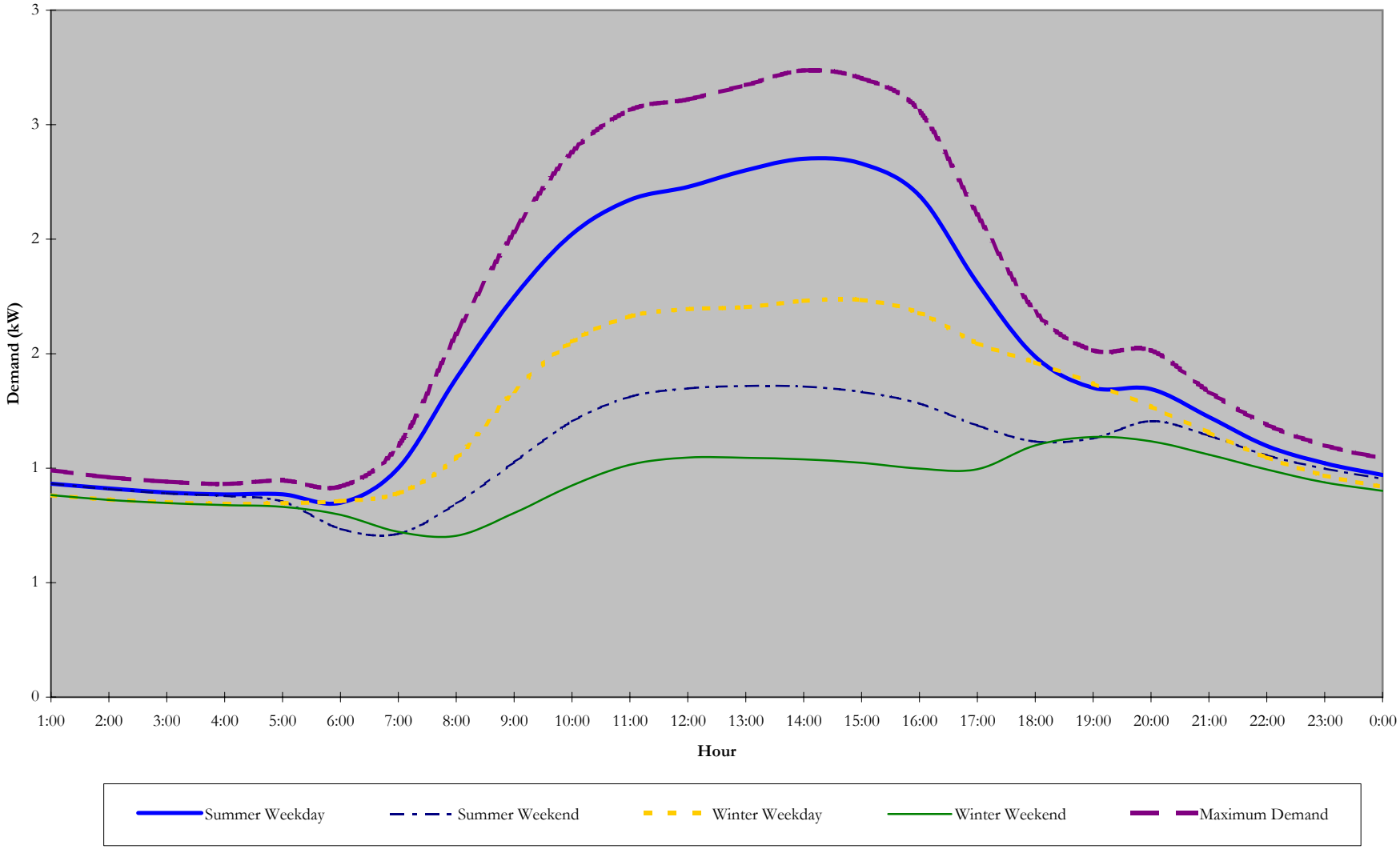
Rate Class Average Load Profiles
TOU-Secondary Rate Schedule



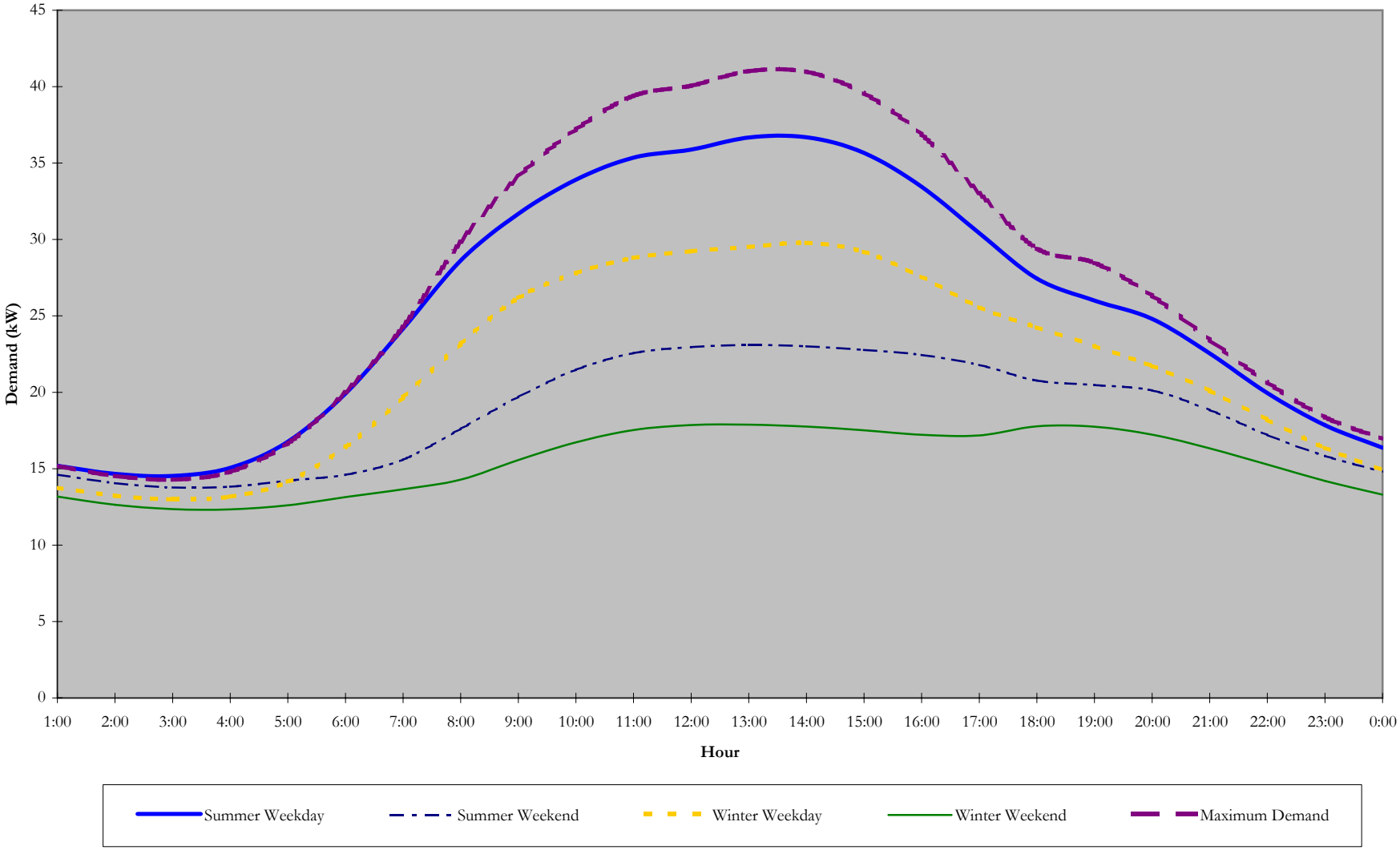
Rate Class Average Load Profiles
TOU-Subtransmission Rate Schedule



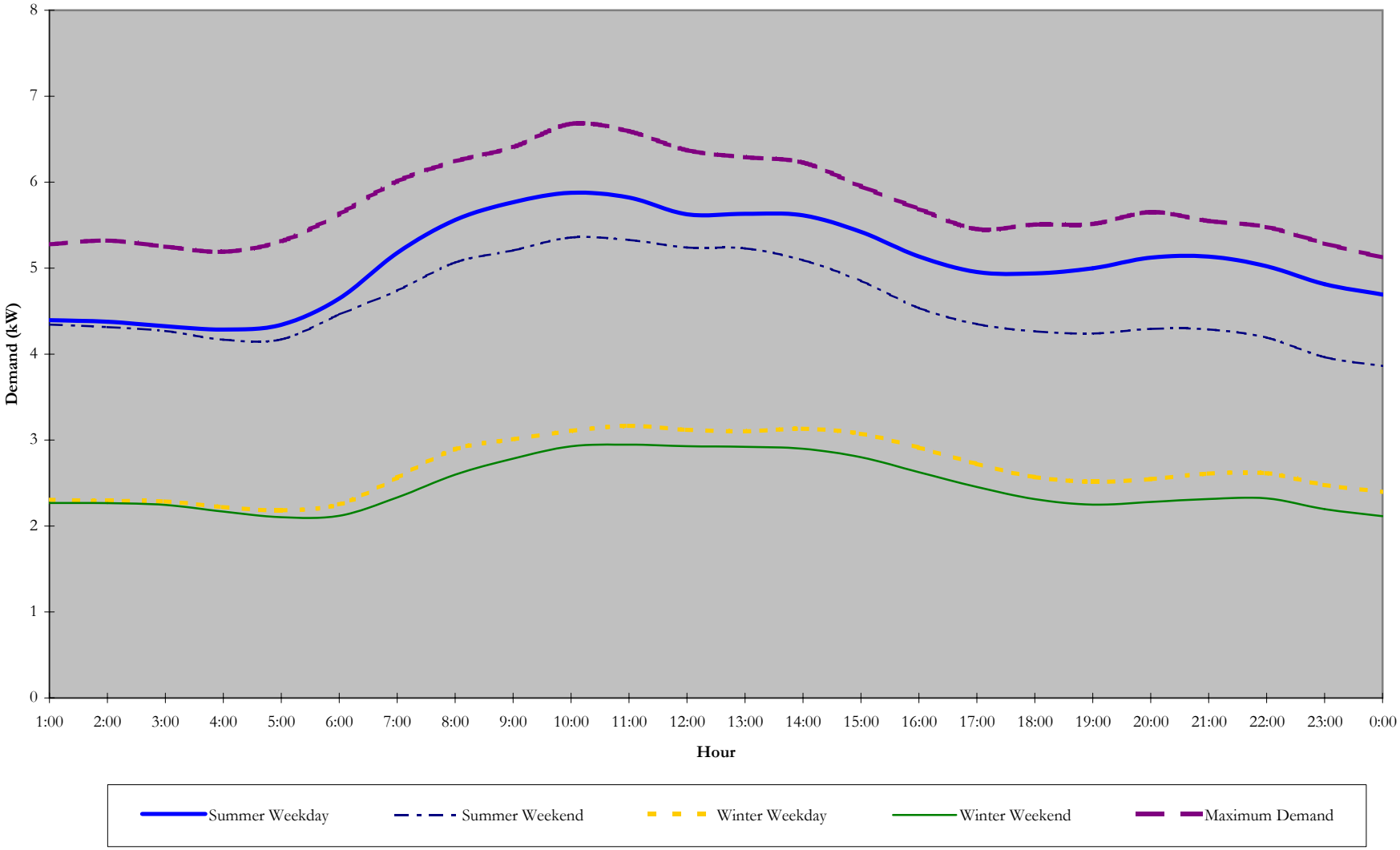
Rate Class Average Load Profile
GS-1 Rate Schedule



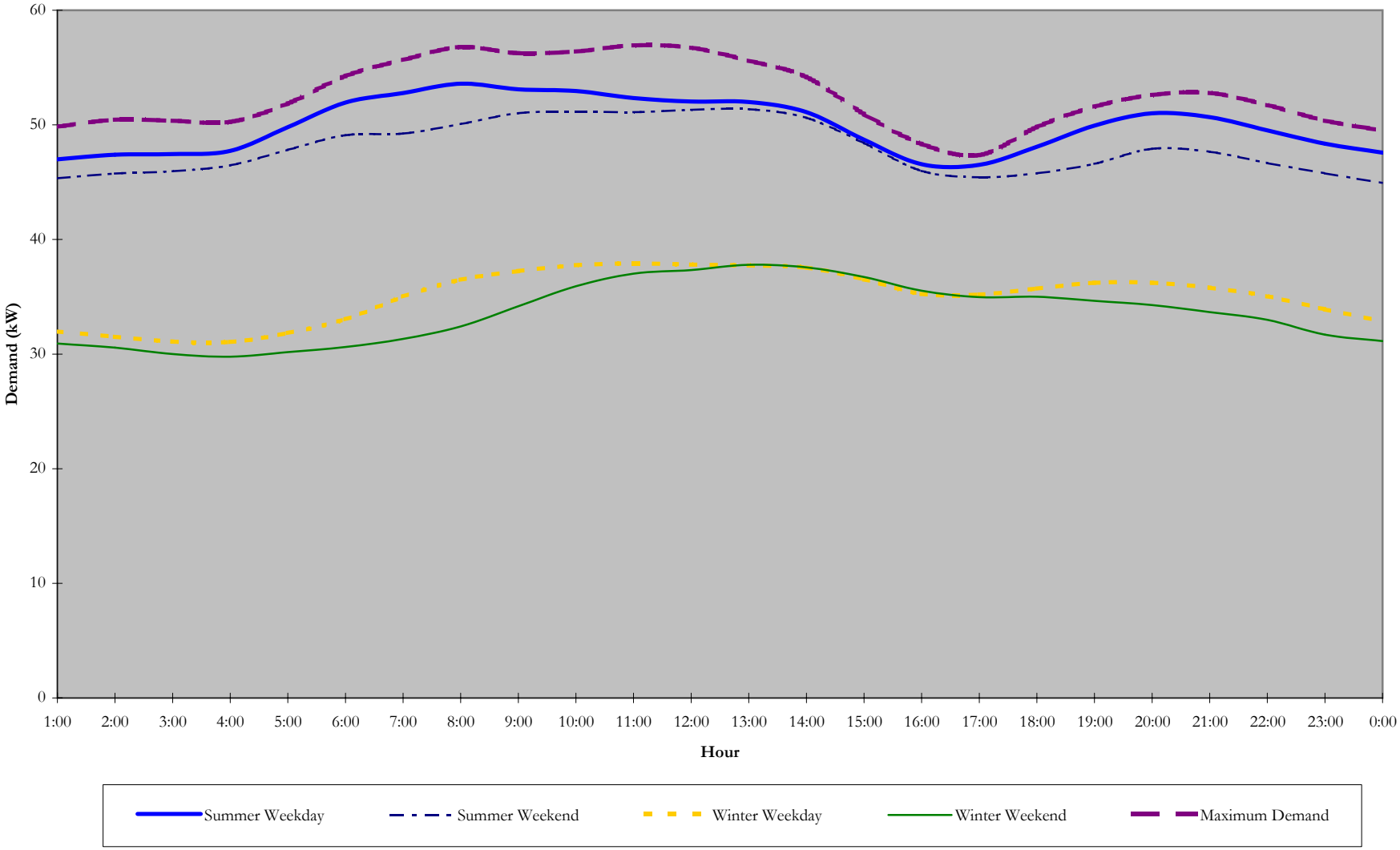
Rate Class Average Load Profiles
GS-2 Rate Schedule



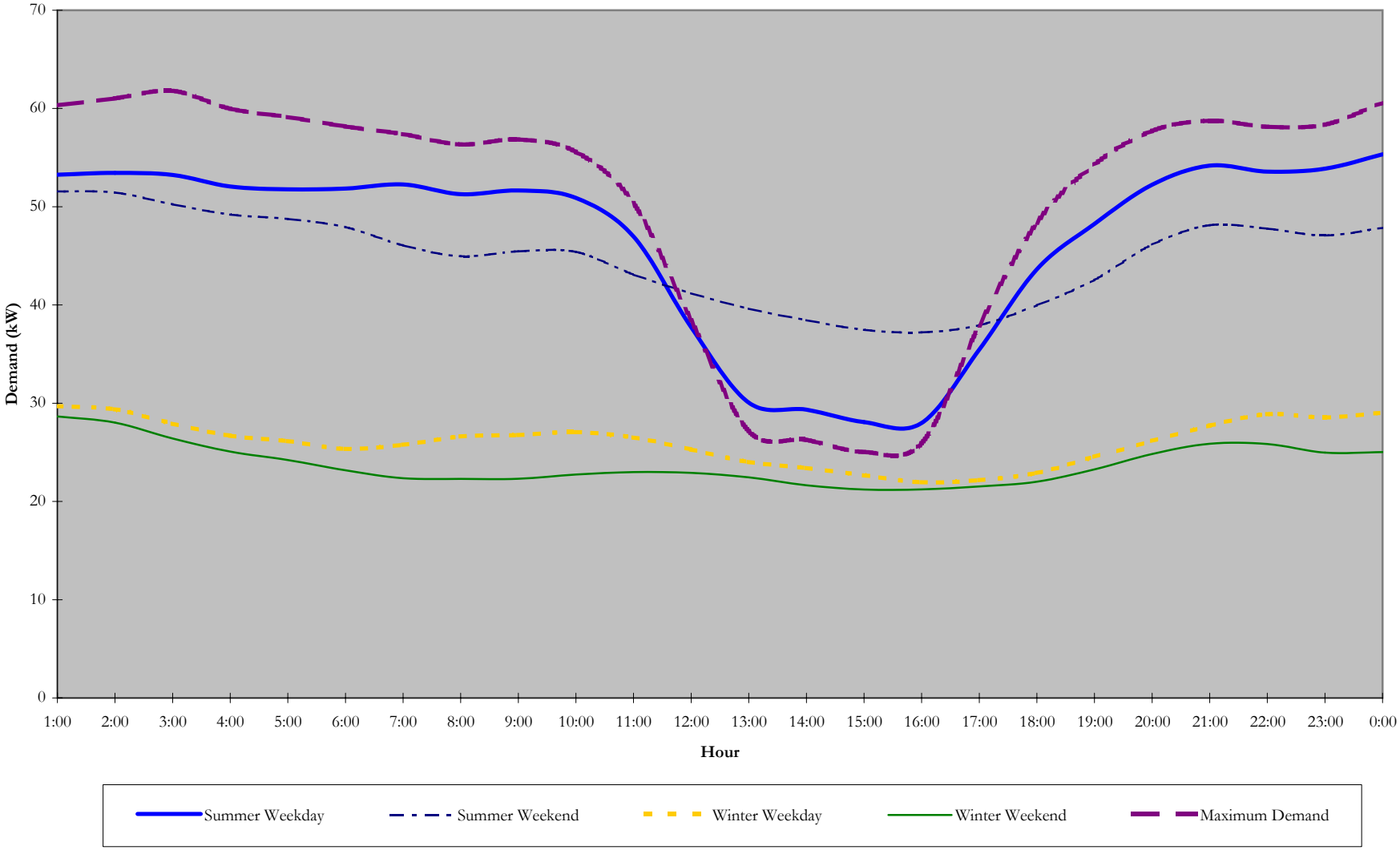
Rate Class Average Load Profiles
PA-1 Rate Schedule



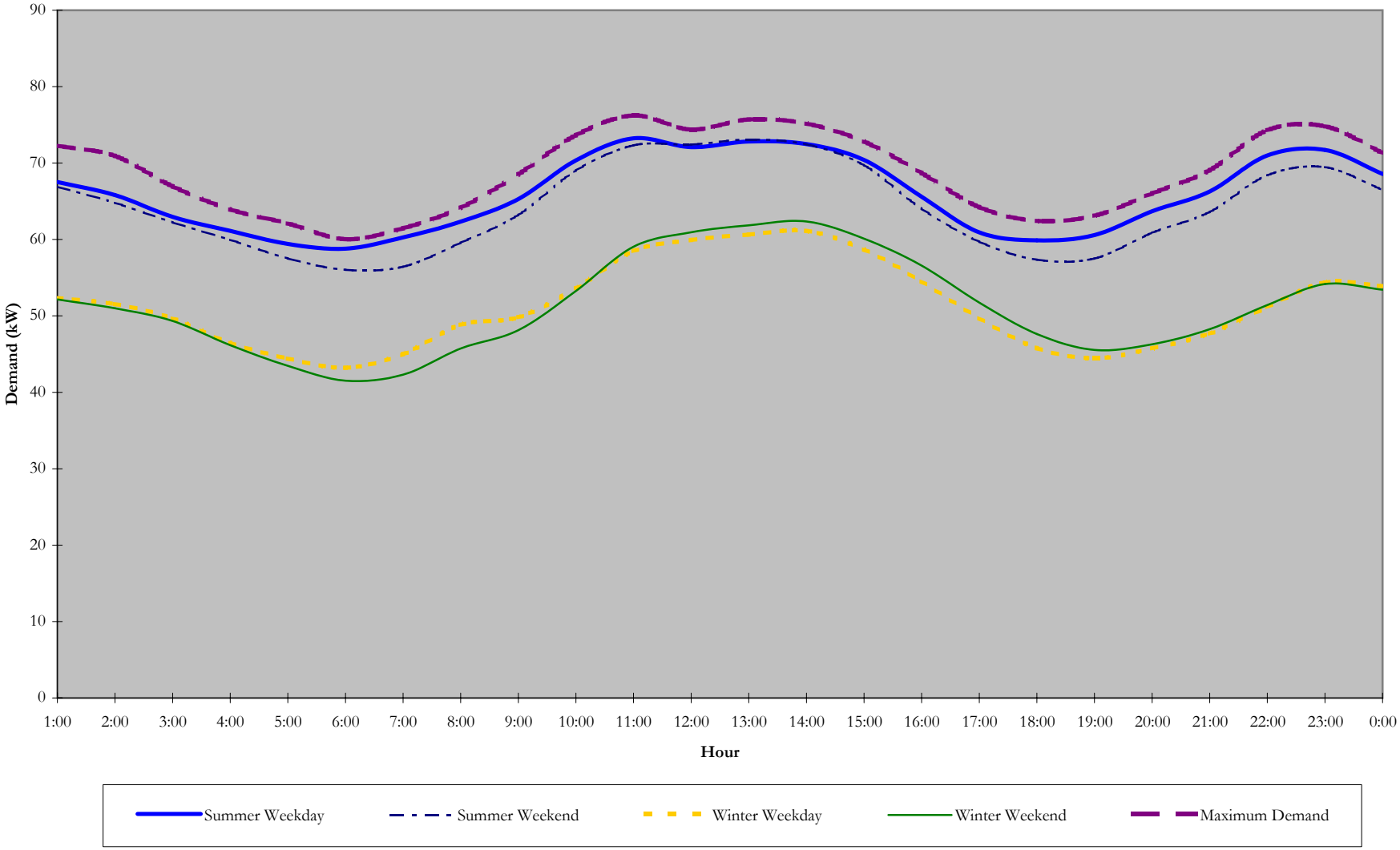
Rate Class Average Load Profiles
PA-2 Rate Schedule



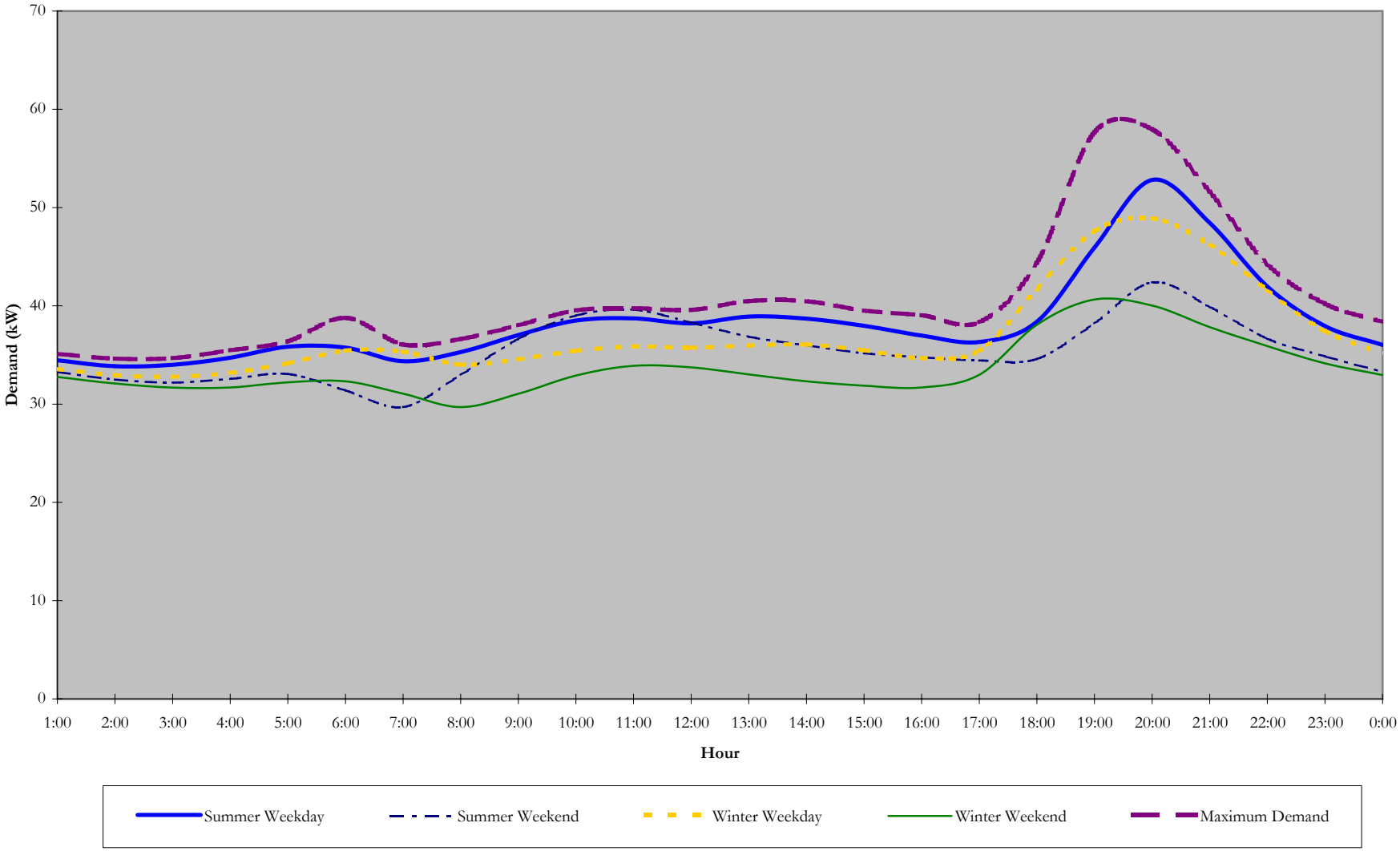
Rate Class Average Load Profiles
AG-TOU Rate Schedule



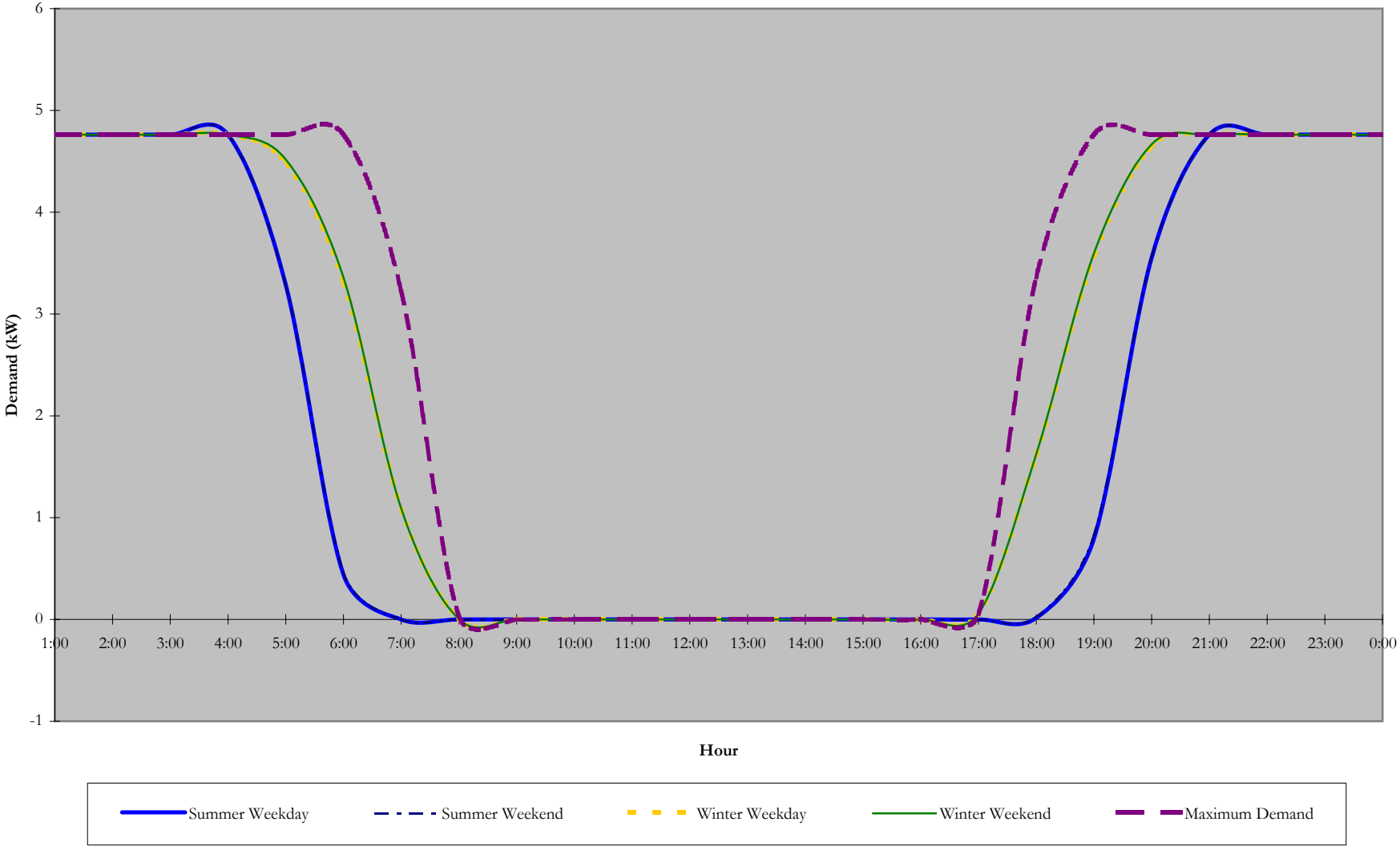
Rate Class Average Load Profiles
TOU-PA-5 Rate Schedule



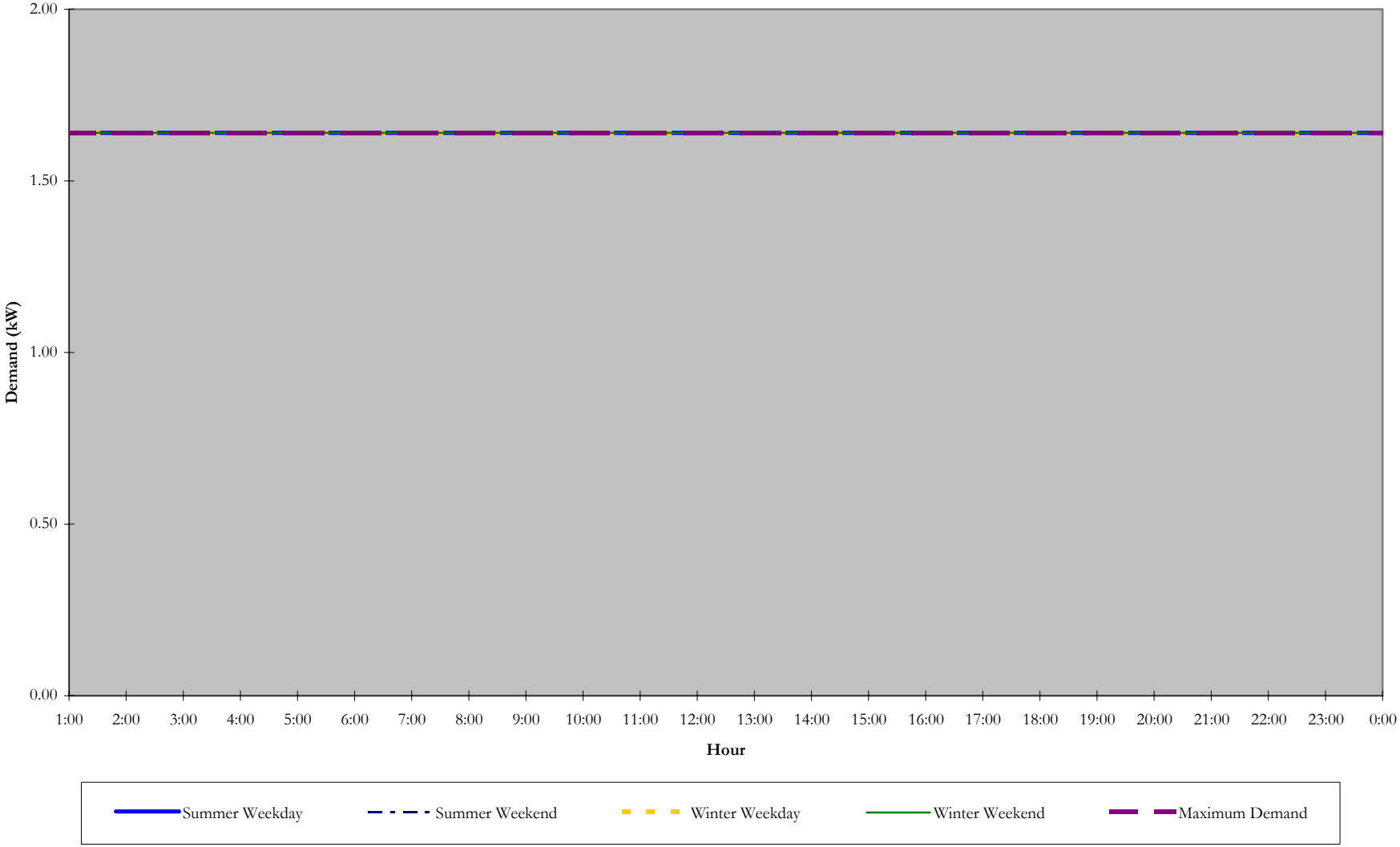
Rate Class Average Load Profiles
TOU-GS Rate Schedule



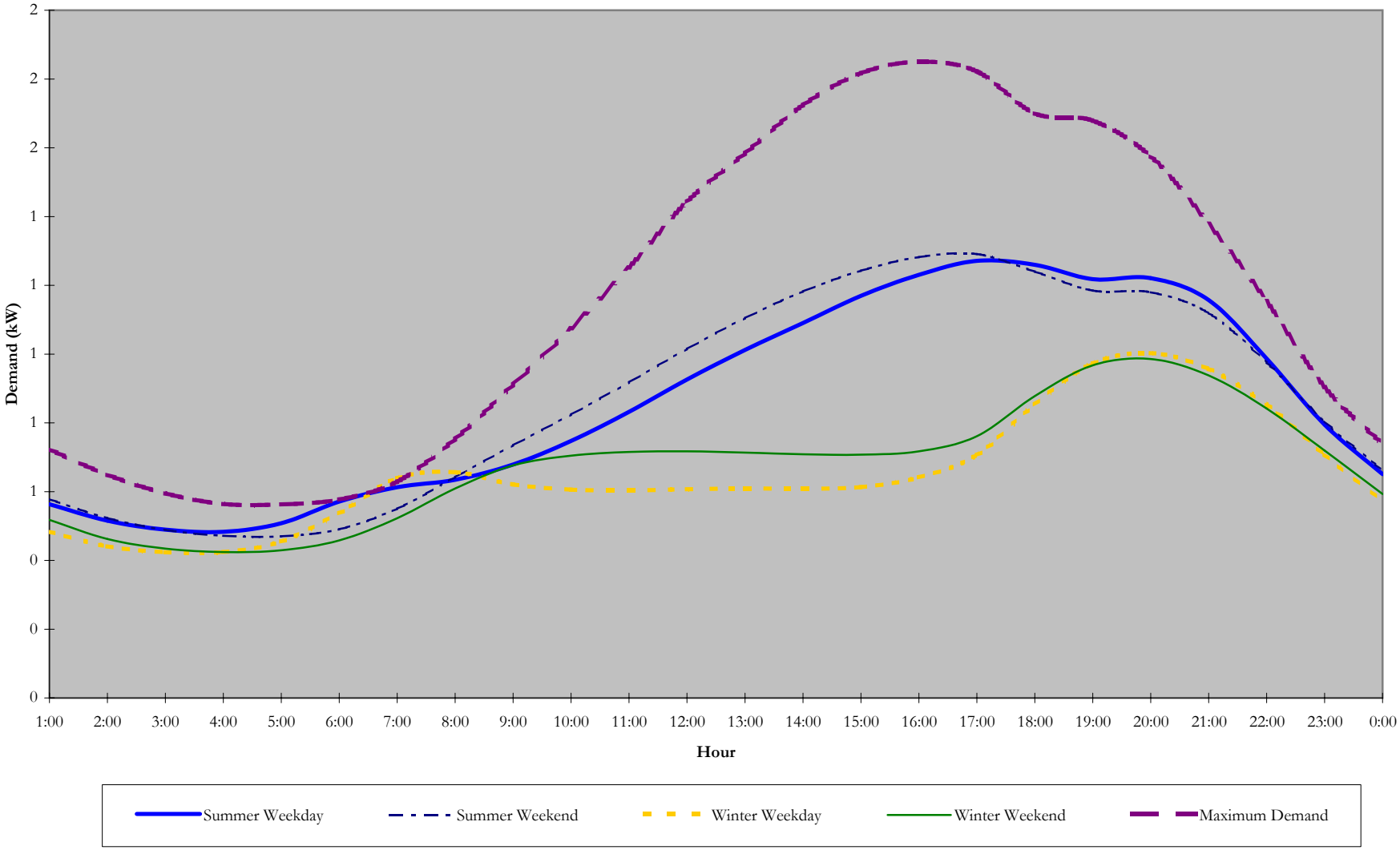
Rate Class Average Load Profiles
Street Light Rate Schedules



Rate Class Average Load Profiles
TC-1 Rate Schedule



Rate Class Average Load Profile
Domestic Rate Schedule



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TOU-GS (Time-Of-Use - General Service - Demand Metered)
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Includes accounts where SCE determines that: 70% or more of the customer's electrical usage is for general agricultural purposes or for general water or sewerage pumping or for oil pumping by customers with a Standard Industrial Classification (SIC) Code of 1311; none of any remaining electrical usage is for purposes for which a domestic schedule is applicable; and, the customer's account has 35 horsepower or more of total connected load or 35 kilowatts or more of Maximum Demand

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Includes service for the lighting of streets, highways, and publicly-owned and publicly-operated automobile parking lots which are open to the general public where SCE owns and maintains the street lighting equipment and associated facilities included under this schedule.

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